



Memorandum

To: Stephanie Vaughn, EPA Region 2
Elizabeth Buckrucker, USACE

From: Frank Tsang and Scott Kirchner (CDM Smith)

Date: November 27, 2012

Subject: Split Sample Evaluation and Comments on the CPG Draft 2010 Small Forage Fish Tissue Chemistry Data Report for the Lower Passaic River Study Area
Dated July 18, 2012

At the request of the United State Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE), CDM Federal Programs Corporation (CDM Smith) subcontracted analyses for split small forage fish tissue samples from the Lower Passaic River Study Area. The analytical data from these split samples was compared to analytical data from the Cooperating Parties Group (CPG) laboratory. In addition to split sample evaluation the EPA and USACE also requested CDM Smith to review the Draft 2010 Small Forage Fish Tissue Chemistry Data for the Lower Passaic River Study Area Report, dated July 18, 2012. The draft report was prepared by Windward Environmental (Windward) on behalf of the CPG for the Lower Passaic River Restoration Project.

The following information summarizes the Split Sample Data Comparison for the 2010 Lower Passaic River Small Forage Fish Tissue Sampling Oversight.

- Dioxins/Furans: Comparison of the dioxin and furan results for the small forage fish split samples showed that the CPG and EPA laboratory data was comparable. The variance between the two sets of data was low and was within acceptance criteria for all of the split samples, as shown in Tables 1-1, 1-2, and 1-3.
- Polycyclic Aromatic Hydrocarbons and Alkylated Polycyclic Aromatic Hydrocarbons: The CPG and EPA analysis generally yielded similar results for polycyclic aromatic hydrocarbons (PAHs). A significant number of variances between the EPA and the CPG laboratory results exceeded the acceptance limits, however the majority of the calculated variances were within acceptance limits (see Tables 2-1, 2-2, and 2-3).
- Organochlorine Pesticides: Tables 3-1, 3-2, and 3-3 compare split sample tissue results for organochlorine pesticides. The majority of the results were within acceptance limits. The one exception was the analytical results for trans-Nonachlor, where the EPA laboratory results were significantly higher than the CPG laboratory results.
- Polychlorinated Biphenyl Congeners: The variance between the split samples for the PCB congener analysis was much higher than for the other analytical methods. There was a significant low bias for the EPA laboratory results in comparison to the CPG laboratory results, as can be seen in Tables 4-1, 4-2, and 4-3. The most marked differences were found in the

comparison of the analytical results for sample LPR6-DCWB-COMP02, where most RPDs exceeded 110 percent. Sample LPR6-DCWB-COMP02 was only used for PCB split sample analysis therefore it was not possible to determine whether this occurrence may have been matrix related. Due to the small number of split samples, no conclusions can be drawn from this disparity in the split sample data. It is recommended that both laboratories be contacted and asked to review sample preparation and data calculations for PCB congener analysis of sample LPR6-DCWB-COMP02.

Oversight Program Summary

Oversight was conducted in accordance with the Final Quality Assurance Project Plan (QAPP), Addendum No. 5, Revision 1, Fish Tissue Analysis for the Lower Passaic River Restoration Project. The split sample program consisted of six small forage fish tissue split samples:

- Three of the split samples, LPR2-FHWB-COMP08, LPR3-FHWB-COMP10, and LPR8-NPWB-COMP01 were analyzed by the EPA laboratory for dioxins and furans, organochlorine pesticides, polycyclic aromatic hydrocarbons (PAHs) and alkylated PAHs.
- Three of the splits samples, LPR4-FHWB-COMP14, LPR4-FHWB-COMP15, and LPR6-DCWB-COMP02 were analyzed for polychlorinated biphenyls (PCB) congeners.

Data Comparison Methodology

To examine the parent and split sample datasets for potential bias, CPG sample and EPA split sample data were evaluated according to the following criteria:

- For each chemical or parameter, if both the EPA laboratory and CPG laboratory results were detected and were both greater than or equal to five times the EPA RL, percent RPD was calculated. Variance was evaluated by a measurement performance criteria of less than or equal to 40 percent RPD as defined on Worksheet # 28 of the QAPP. The RPD was calculated using the numerical difference between the CPG result and the EPA result, according to Equation 1,

$$\% \text{ RPD} = \frac{\frac{|R_{EPA} - R_{CPG}|}{\frac{R_{EPA} + R_{CPG}}{2}}}{100} \quad (\text{Equation 1})$$

where R_{EPA} is the result from the EPA laboratory, R_{CPG} is the result from the CPG laboratory. The absolute value of the difference was not used so that trends in analytical results could be identified. In all instances the CPG result was subtracted from the EPA result. Results that were positive indicated that the EPA laboratory result was the greater of the two and results that were negative indicated that the CPG laboratory result was the greater of the two.

- If one or both results reported by the EPA and CPG laboratories were detected but were less than five times the EPA RL or if one result was reported as not detected, variance was evaluated by the absolute difference between the two values according to Equation 2. A criterion of two times the EPA RL was used to evaluate absolute differences.

$$\frac{|R_{EPA} - R_{CPG}|}{2 \times \text{EPA RL}} \quad (\text{Equation 2})$$

- If both the EPA laboratory and CPG laboratory results were non-detect for a chemical or parameter, the variance was not evaluated.

In summary, the split sample comparison for the 2010 Small Forage Fish Tissue for the Lower Passaic River was limited to six samples. Of these six samples, three split samples were compared for dioxin and furans, organochlorine pesticides, PAH and alkylated PAH analysis. The other three split samples were selected for the comparison of PCB congener analysis only. Since the data set is limited, the analytical variance of small forage fish tissue analysis between the EPA laboratory and CPG laboratory was evaluated solely on the basis of percent RPD and absolute difference.

Comparison of analytical data indicated that the majority of the chemical and parameter results were comparable. Significant differences were found between some of the alkylated PAH and PCB congener results. About 30 percent of the CPG laboratory alkylated PAH results had a high bias in comparison to the EPA laboratory results. It was noted that the alkylated PAHs compounds were analyzed by two different methods. The EPA laboratory analyzed alkylated PAHs by a modification of EPA Method 8270C and the CPG laboratory analyzed alkylated PAHs by a modification of CARB 429. In addition to the difference in analytical methods used, the RLs for the CPG alkylated PAH results were one to two orders of magnitude higher than the RLs for the EPA laboratory. The comparison of split samples for PCB congener analysis showed the highest variance in analytical results. The majority of PCB congener results for samples LPR4-FHWB-COMP14 and LPR4-FHWB-COMP15 were within the acceptance criteria. The comparison of PCB congener results for sample LPR6-DCWB-COMP02 showed a much greater degree of variability. The EPA laboratory PCB congener results were appreciably lower than the CPG laboratory results, in most cases three to five times lower. Both sets of PCB congener results were analyzed by comparable methods, but EPA laboratory RLs were on the order of a magnitude higher than the CPG laboratory.

The comparison of analytical results between the EPA laboratory and the CPG laboratory showed comparable results for the majority of the compounds. The differences found in alkylated PAH and PCB congener results may be attributable to differences in RLs, where the results with lower RLs would theoretically be more precise than those with higher RLs. Overall the PCB congener results for samples LPR4-FHWB-COMP14 and LPR4-FHWB-COMP15 were comparable and the observed high variance in PCB congener results for sample LPR6-DCWB-COMP02 may have been an anomaly.

Comments on the CPG Draft 2010 Small Forage Fish Tissue Sampling Study Data for the Lower Passaic River Study Area report are included in Attachment A.

Table 1-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Dioxins and Furans

| Location ID: Sample ID: Sample Date: | | | | | LPR2 LPR2-FHWB-COMP08 6/23/2010 | | | |
|---|------------|-------|-------------------|----------|---------------------------------------|------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | ng/kg | EPA 1613B | 1.46 | 0.563 J | 0.65 J | | 0.09 |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin | 35822-46-9 | ng/kg | EPA 1613B | 1.38 | 0.644 EMPC-J | 0.6 J | | 0.04 |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | ng/kg | EPA 1613B | 1.46 | 0.055 U | 0.25 U | | |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | ng/kg | EPA 1613B | 1.46 | 0.548 EMPC-J | 0.53 J | | 0.02 |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin | 39227-28-6 | ng/kg | EPA 1613B | 1.65 | 0.095 J | 0.28 U | | 0.19 |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 57117-44-9 | ng/kg | EPA 1613B | 1.38 | 0.132 EMPC-J | 0.18 U | | 0.05 |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin | 57653-85-7 | ng/kg | EPA 1613B | 1.62 | 0.172 J | 0.28 U | | 0.11 |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | ng/kg | EPA 1613B | 1.53 | 0.0603 U | 0.29 U | | |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin | 19408-74-3 | ng/kg | EPA 1613B | 1.57 | 0.0496 U | 0.3 U | | |
| 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | ng/kg | EPA 1613B | 1.34 | 0.148 EMPC-J | 0.19 U | | 0.04 |
| 1,2,3,7,8-Pentachlorodibenzo-p-Dioxin | 40321-76-4 | ng/kg | EPA 1613B | 1.52 | 0.344 J | 0.26 U | | 0.08 |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | ng/kg | EPA 1613B | 1.54 | 0.108 EMPC-J | 0.2 U | | 0.09 |
| 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | ng/kg | EPA 1613B | 1.37 | 0.99 J | 0.89 J | | 0.10 |
| 2,3,7,8-Tetrachlorodibenzofuran | 51207-31-9 | ng/kg | EPA 1613B | 0.321 | 0.939 | 1.1 | | 0.161 |
| 2,3,7,8-Tetrachlorodibenzo-P-Dioxin | 1746-01-6 | ng/kg | EPA 1613B | 0.291 | 29.7 | 25 | 17.2 | |
| Heptachlorinated Dibenzofurans, (Total) | 38998-75-3 | ng/kg | EPA 1613B | none | 0.824 | 0.65 | | 0.17 |
| Heptachlorinated Dibenzo-P-Dioxins, (Total) | 37871-00-4 | ng/kg | EPA 1613B | none | 0.551 | 0.6 | | 0.05 |
| Hexachlorinated Dibenzofurans, (Total) | 55684-94-1 | ng/kg | EPA 1613B | none | 0.0603 U | 0.53 | | 0.47 |
| Hexachlorinated Dibenzo-P-Dioxins, (Total) | 34465-46-8 | ng/kg | EPA 1613B | none | 0.267 | 0.29 U | | 0.02 |
| Octachlorodibenzofuran | 39001-02-0 | ng/kg | EPA 1613B | 3.03 | 0.736 J | 0.51 U | | 0.23 |
| Octachlorodibenzo-P-Dioxin | 3268-87-9 | ng/kg | EPA 1613B | 2.91 | 3.86 | 2.7 EMPC-J | | 1.16 |
| Pentachlorinated Dibenzofurans, (Total) | 30402-15-4 | ng/kg | EPA 1613B | none | 1.59 | 0.89 | | 0.70 |
| Pentachlorinated Dibenzo-P-Dioxins, (Total) | 36088-22-9 | ng/kg | EPA 1613B | none | 0.344 | 0.26 U | | 0.08 |
| Tetrachlorinated Dibenzofurans, (Total) | 30402-14-3 | ng/kg | EPA 1613B | none | 2.03 | 1.1 | | 0.93 |
| Tetrachlorinated Dibenzo-P-Dioxins, (Total) | 41903-57-5 | ng/kg | EPA 1613B | none | 29.7 | 25 | 17.2 | |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

Table 1-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Dioxins and Furans

ABS = absolute difference
CPG = Cooperating Parties Group
ID = identification
ng/kg = nanogram per kilogram
none = reporting limit was not provided with analytical data
RL = reporting limit
RPD = relative percent difference
EPA = United States Environmental Protection Agency
% = percent

Data Validation Qualifiers

EMPC-J = Estimated detect data due to failure of one or more qualitative identification criteria.
J = Estimated detect data.
U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.
UJ = Estimated non-detect data due to exceeded quality control criteria.

Table 1-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Dioxins and Furans

| Location ID: Sample ID: Sample Date: | | | | | LPR3 LPR3-FHWR-COMP10 6/25/2010 | | | |
|---|------------|-------|-------------------|----------|---------------------------------------|-------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | ng/kg | EPA 1613B | 1.47 | 0.891 J | 1.1 J | | 0.21 |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin | 35822-46-9 | ng/kg | EPA 1613B | 1.4 | 0.949 J | 1.4 J | | 0.45 |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | ng/kg | EPA 1613B | 1.47 | 0.0597 U | 0.28 U | | |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | ng/kg | EPA 1613B | 1.47 | 0.481 EMPC-J | 0.48 EMPC-J | | 0.00 |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin | 39227-28-6 | ng/kg | EPA 1613B | 1.66 | 0.09 J | 0.27 U | | 0.18 |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 57117-44-9 | ng/kg | EPA 1613B | 1.4 | 0.163 EMPC-J | 0.15 U | | 0.01 |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin | 57653-85-7 | ng/kg | EPA 1613B | 1.63 | 0.187 J | 0.28 U | | 0.09 |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | ng/kg | EPA 1613B | 1.54 | 0.05 U | 0.27 U | | |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin | 19408-74-3 | ng/kg | EPA 1613B | 1.59 | 0.065 J | 0.32 U | | 0.26 |
| 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | ng/kg | EPA 1613B | 1.35 | 0.114 EMPC-J | 0.17 U | | 0.06 |
| 1,2,3,7,8-Pentachlorodibenzo-p-Dioxin | 40321-76-4 | ng/kg | EPA 1613B | 1.53 | 0.244 J | 0.29 U | | 0.05 |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | ng/kg | EPA 1613B | 1.56 | 0.08 EMPC-J | 0.2 U | | 0.12 |
| 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | ng/kg | EPA 1613B | 1.38 | 0.634 J | 0.81 J | | 0.18 |
| 2,3,7,8-Tetrachlorodibenzofuran | 51207-31-9 | ng/kg | EPA 1613B | 0.323 | 0.791 | 0.99 J | | 0.199 |
| 2,3,7,8-Tetrachlorodibenzo-P-Dioxin | 1746-01-6 | ng/kg | EPA 1613B | 0.294 | 28.1 | 29 | -3.2 | |
| Heptachlorinated Dibenzofurans, (Total) | 38998-75-3 | ng/kg | EPA 1613B | none | 0.891 | 1.5 | | 0.61 |
| Heptachlorinated Dibenzo-P-Dioxins, (Total) | 37871-00-4 | ng/kg | EPA 1613B | none | 0.949 | 2.8 | | 1.85 |
| Hexachlorinated Dibenzofurans, (Total) | 55684-94-1 | ng/kg | EPA 1613B | none | 0.221 | 0.8 EMPC-J | | 0.58 |
| Hexachlorinated Dibenzo-P-Dioxins, (Total) | 34465-46-8 | ng/kg | EPA 1613B | none | 0.637 | 0.29 U | | 0.35 |
| Octachlorodibenzofuran | 39001-02-0 | ng/kg | EPA 1613B | 3.05 | 1.3 J | 1.6 J | | 0.30 |
| Octachlorodibenzo-P-Dioxin | 3268-87-9 | ng/kg | EPA 1613B | 2.94 | 8.32 | 11 | | 2.68 |
| Pentachlorinated Dibenzofurans, (Total) | 30402-15-4 | ng/kg | EPA 1613B | none | 1.13 | 0.81 | | 0.32 |
| Pentachlorinated Dibenzo-P-Dioxins, (Total) | 36088-22-9 | ng/kg | EPA 1613B | none | 0.244 | 0.29 U | | 0.05 |
| Tetrachlorinated Dibenzofurans, (Total) | 30402-14-3 | ng/kg | EPA 1613B | none | 1.4 | 0.99 | | 0.41 |
| Tetrachlorinated Dibenzo-P-Dioxins, (Total) | 41903-57-5 | ng/kg | EPA 1613B | none | 28.1 | 29 | -3.2 | |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

Table 1-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Dioxins and Furans

ABS = absolute difference
CPG = Cooperating Parties Group
ID = identification
ng/kg = nanogram per kilogram
none = reporting limit was not provided with analytical data
RL = reporting limit
RPD = relative percent difference
EPA = United States Environmental Protection Agency
% = percent

Data Validation Qualifiers

EMPC-J = Estimated detect data due to failure of one or more qualitative identification criteria.
J = Estimated detect data.
U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

Table 1-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Dioxins and Furans

| Location ID: Sample ID: Sample Date: | | | | | LPR8 LPR8-NPWB-COMP01 7/28/2010 | | | |
|---|------------|-------|-------------------|----------|---------------------------------------|-------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | ng/kg | EPA 1613B | 1.47 | 3.54 | 3.6 J | | 0.06 |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin | 35822-46-9 | ng/kg | EPA 1613B | 1.39 | 11.9 | 12 | -0.8 | |
| 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | ng/kg | EPA 1613B | 1.47 | 0.272 EMPC-J | 0.19 EMPC-J | | 0.08 |
| 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | ng/kg | EPA 1613B | 1.47 | 0.597 EMPC-J | 0.48 J | | 0.12 |
| 1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin | 39227-28-6 | ng/kg | EPA 1613B | 1.66 | 0.45 J | 0.43 J | | 0.02 |
| 1,2,3,6,7,8-Hexachlorodibenzofuran | 57117-44-9 | ng/kg | EPA 1613B | 1.39 | 0.38 EMPC-J | 0.38 J | | 0.00 |
| 1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin | 57653-85-7 | ng/kg | EPA 1613B | 1.63 | 1.54 J | 1.1 J | | 0.44 |
| 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | ng/kg | EPA 1613B | 1.54 | 0.0895 U | 0.048 U | | |
| 1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin | 19408-74-3 | ng/kg | EPA 1613B | 1.58 | 0.566 J | 0.68 U | | 0.11 |
| 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | ng/kg | EPA 1613B | 1.35 | 0.289 EMPC-J | 0.39 J | | 0.10 |
| 1,2,3,7,8-Pentachlorodibenzo-p-Dioxin | 40321-76-4 | ng/kg | EPA 1613B | 1.53 | 0.639 J | 0.7 J | | 0.06 |
| 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | ng/kg | EPA 1613B | 1.56 | 0.264 EMPC-J | 0.47 J | | 0.21 |
| 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | ng/kg | EPA 1613B | 1.38 | 0.852 J | 1.2 J | | 0.35 |
| 2,3,7,8-Tetrachlorodibenzofuran | 51207-31-9 | ng/kg | EPA 1613B | 0.324 | 4.23 | 4.8 | -12.6 | |
| 2,3,7,8-Tetrachlorodibenzo-P-Dioxin | 1746-01-6 | ng/kg | EPA 1613B | 0.293 | 15.3 | 16 | -4.5 | |
| Heptachlorinated Dibenzofurans, (Total) | 38998-75-3 | ng/kg | EPA 1613B | none | 7.39 | 8.3 EMPC-J | | 0.91 |
| Heptachlorinated Dibenzo-P-Dioxins, (Total) | 37871-00-4 | ng/kg | EPA 1613B | none | 23 | 25 | | 2.00 |
| Hexachlorinated Dibenzofurans, (Total) | 55684-94-1 | ng/kg | EPA 1613B | none | 4.32 | 6 EMPC-J | | 1.68 |
| Hexachlorinated Dibenzo-P-Dioxins, (Total) | 34465-46-8 | ng/kg | EPA 1613B | none | 4.05 | 4.8 EMPC-J | | 0.75 |
| Octachlorodibenzofuran | 39001-02-0 | ng/kg | EPA 1613B | 3.05 | 6.54 | 6.2 J | | 0.340 |
| Octachlorodibenzo-P-Dioxin | 3268-87-9 | ng/kg | EPA 1613B | 2.93 | 94.1 | 100 | -6.1 | |
| Pentachlorinated Dibenzofurans, (Total) | 30402-15-4 | ng/kg | EPA 1613B | none | 3.19 | 5.8 EMPC-J | | 2.61 |
| Pentachlorinated Dibenzo-P-Dioxins, (Total) | 36088-22-9 | ng/kg | EPA 1613B | none | 0.745 | 1.3 EMPC-J | | 0.56 |
| Tetrachlorinated Dibenzofurans, (Total) | 30402-14-3 | ng/kg | EPA 1613B | none | 6.49 | 9 EMPC-J | | 2.51 |
| Tetrachlorinated Dibenzo-P-Dioxins, (Total) | 41903-57-5 | ng/kg | EPA 1613B | none | 16.3 | 17 EMPC-J | -4.2 | |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

Table 1-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Dioxins and Furans

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RL = reporting limit
RPD = relative percent difference
EPA = United States Environmental Protection Agency
% = percent

Data Validation Qualifiers

EMPC-J = Estimated detect data due to failure of one or more qualitative identification criteria.
J = Estimated detect data.
U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.
UJ = Estimated non-detect data due to exceeded quality control criteria.

Table 2-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polycyclic Aromatic Hydrocarbons and
Alkylated Polycyclic Aromatic Hydrocarbons

| Location ID: Sample ID: Sample Date: | | | | | LPR2 LPR2-FHWB-COMP08 6/23/2010 | | | |
|--|-------------|-------|--------------------|----------|---------------------------------------|------------|-------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| 1,6,7-Trimethyl-naphthalene | 2245-38-7 | µg/kg | EPA 8270C/CARB 429 | 0.485 | 3.72 | 3.3 UJ | | 0.42 |
| 1-Methylnaphthalene | 90-12-0 | µg/kg | EPA 8270C/CARB 429 | 0.488 | 4.29 | 7.1 J | -49.3 | |
| 1-Methyl-phenanthrene | 832-69-9 | µg/kg | EPA 8270C/CARB 429 | 0.486 | 0.827 | 1.4 UJ | | 0.57 |
| 2,6-Dimethyl-naphthalene | 581-42-0 | µg/kg | EPA 8270C/CARB 429 | 0.485 | 2.86 | 3.3 J | -14.3 | |
| 2-Methylnaphthalene | 91-57-6 | µg/kg | EPA 8270C/CARB 429 | 0.485 | 3.85 | 3.7 J | 4.0 | |
| Acenaphthene | 83-32-9 | µg/kg | EPA 8270C/CARB 429 | 0.482 | 15.5 | 8.6 J | 57.3 | |
| Acenaphthylene | 208-96-8 | µg/kg | EPA 8270C/CARB 429 | 0.481 | 1.64 | 2.5 U | | 0.86 |
| Anthracene | 120-12-7 | µg/kg | EPA 8270C/CARB 429 | 0.485 | 3.7 | 7.3 J | -65.5 | |
| Benzo(a)anthracene | 56-55-3 | µg/kg | EPA 8270C/CARB 429 | 0.476 | 1.62 | 1.4 J | | 0.22 |
| Benzo(a)pyrene | 50-32-8 | µg/kg | EPA 8270C/CARB 429 | 0.479 | 1.82 | 3.3 J | | 1.48 |
| Benzo(b)fluoranthene | 205-99-2 | µg/kg | EPA 8270C/CARB 429 | 0.479 | 1.82 | 15 UJ | | 13.2 |
| Benzo(g,h,i)perylene | 191-24-2 | µg/kg | EPA 8270C/CARB 429 | 0.468 | 1.23 | 1.7 J | | 0.47 |
| Benzo(j,k)fluoranthene | 207-08-9-JK | µg/kg | EPA 8270C/CARB 429 | 1.01 | 1.94 | 2.8 J | | 0.86 |
| Benzo[e]pyrene | 192-97-2 | µg/kg | EPA 8270C/CARB 429 | 0.476 | 1.63 | 1.7 J | | 0.07 |
| Chrysene | 218-01-9 | µg/kg | EPA 8270C/CARB 429 | 0.49 | 3.11 | 2.6 J | 17.9 | |
| Dibenz(a,h)anthracene | 53-70-3 | µg/kg | EPA 8270C/CARB 429 | 0.478 | 0.269 J | 2.6 UJ | | 2.33 |
| Dibenzothiophene (Synfuel) | 132-65-0 | µg/kg | EPA 8270C/CARB 429 | 0.492 | 1.79 EMPC | 1.3 J | | 0.49 |
| Fluoranthene | 206-44-0 | µg/kg | EPA 8270C/CARB 429 | 0.499 | 8.83 | 11 J | -21.9 | |
| Fluorene | 86-73-7 | µg/kg | EPA 8270C/CARB 429 | 0.48 | 4.51 | 6.9 J | -41.9 | |
| Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/kg | EPA 8270C/CARB 429 | 0.471 | 1.27 | 2.2 U | | 0.93 |
| Naphthalene | 91-20-3 | µg/kg | EPA 8270C/CARB 429 | 0.491 | 2.78 UJ | 5.6 UJ | | |
| Perylene | 198-55-0 | µg/kg | EPA 8270C/CARB 429 | 0.485 | 0.519 | 1 UJ | | 0.48 |
| Phenanthrene | 85-01-8 | µg/kg | EPA 8270C/CARB 429 | 0.48 | 6.15 | 8.4 J | -30.9 | |
| Pyrene | 129-00-0 | µg/kg | EPA 8270C/CARB 429 | 0.495 | 6.64 | 7.4 J | -10.8 | |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

Table 2-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polycyclic Aromatic Hydrocarbons and
Alkylated Polycyclic Aromatic Hydrocarbons

Notes continued:

2. The EPA laboratory referenced EPA Method 8270C Modified as the analytical procedure for sample analysis.
3. The CPG laboratory referenced CARB 429 Modified as the analytical procedure for sample analysis.
4. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

µg/kg = microgram per kilogram

RL = reporting limit

RPD = relative percent difference

EPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

EMPC = Estimated detect data due to failure of one or more qualitative identification criteria.

J = Estimated detect data.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

UJ = Estimated non-detect data due to exceeded quality control criteria.

Table 2-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polycyclic Aromatic Hydrocarbons and
Alkylated Polycyclic Aromatic Hydrocarbons

| Location ID: Sample ID: Sample Date: | | | | | LPR3 LPR3-FHWB-COMP10 6/25/2010 | | | |
|--|-------------|-------|--------------------|----------|---------------------------------------|------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| 1,6,7-Trimethyl-naphthalene | 2245-38-7 | µg/kg | EPA 8270C/CARB 429 | 0.487 | 4.48 | 5.4 J | -18.6 | |
| 1-Methylnaphthalene | 90-12-0 | µg/kg | EPA 8270C/CARB 429 | 0.489 | 4.15 | 6.6 J | -45.6 | |
| 1-Methyl-phenanthrene | 832-69-9 | µg/kg | EPA 8270C/CARB 429 | 0.488 | 2.23 | 4.3 J | -63.4 | |
| 2,6-Dimethyl-naphthalene | 581-42-0 | µg/kg | EPA 8270C/CARB 429 | 0.487 | 4.59 | 5.1 J | -10.5 | |
| 2-Methylnaphthalene | 91-57-6 | µg/kg | EPA 8270C/CARB 429 | 0.487 | 4.17 | 8 J | -62.9 | |
| Acenaphthene | 83-32-9 | µg/kg | EPA 8270C/CARB 429 | 0.484 | 16.7 | 23 J | -31.7 | |
| Acenaphthylene | 208-96-8 | µg/kg | EPA 8270C/CARB 429 | 0.482 | 2.41 | 4.3 J | -56.3 | |
| Anthracene | 120-12-7 | µg/kg | EPA 8270C/CARB 429 | 0.486 | 6.1 | 10 J | -48.4 | |
| Benzo(a)anthracene | 56-55-3 | µg/kg | EPA 8270C/CARB 429 | 0.478 | 6.3 | 5 J | 23.0 | |
| Benzo(a)pyrene | 50-32-8 | µg/kg | EPA 8270C/CARB 429 | 0.481 | 6.68 | 7.7 J | -14.2 | |
| Benzo(b)fluoranthene | 205-99-2 | µg/kg | EPA 8270C/CARB 429 | 0.48 | 6.01 | 21 UJ | | 14.99 |
| Benzo(g,h,i)perylene | 191-24-2 | µg/kg | EPA 8270C/CARB 429 | 0.47 | 4.16 | 3.6 J | 14.4 | |
| Benzo(j,k)fluoranthene | 207-08-9-JK | µg/kg | EPA 8270C/CARB 429 | 1.01 | 6.5 | 6.4 J | 1.6 | |
| Benzo[e]pyrene | 192-97-2 | µg/kg | EPA 8270C/CARB 429 | 0.478 | 5.51 | 6.9 J | -22.4 | |
| Chrysene | 218-01-9 | µg/kg | EPA 8270C/CARB 429 | 0.492 | 9.38 | 9.3 J | 0.9 | |
| Dibenz(a,h)anthracene | 53-70-3 | µg/kg | EPA 8270C/CARB 429 | 0.479 | 1.19 | 2.9 UJ | | 1.71 |
| Dibenzothiophene (Synfuel) | 132-65-0 | µg/kg | EPA 8270C/CARB 429 | 0.494 | 2.61 | 2.6 J | 0.4 | |
| Fluoranthene | 206-44-0 | µg/kg | EPA 8270C/CARB 429 | 0.5 | 18.4 | 19 J | -3.2 | |
| Fluorene | 86-73-7 | µg/kg | EPA 8270C/CARB 429 | 0.482 | 6.08 | 9.7 J | -45.9 | |
| Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/kg | EPA 8270C/CARB 429 | 0.472 | 4.19 | 6.1 U | | 1.91 |
| Naphthalene | 91-20-3 | µg/kg | EPA 8270C/CARB 429 | 0.492 | 3.54 U | 8.3 UJ | | |
| Perylene | 198-55-0 | µg/kg | EPA 8270C/CARB 429 | 0.486 | 1.8 | 1.3 UJ | | 0.50 |
| Phenanthrene | 85-01-8 | µg/kg | EPA 8270C/CARB 429 | 0.482 | 12.3 | 16 J | -26.1 | |
| Pyrene | 129-00-0 | µg/kg | EPA 8270C/CARB 429 | 0.496 | 16.9 | 15 J | 11.9 | |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

Table 2-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polycyclic Aromatic Hydrocarbons and
Alkylated Polycyclic Aromatic Hydrocarbons

Notes continued:

2. The EPA laboratory referenced EPA Method 8270C Modified as the analytical procedure for sample analysis.
3. The CPG laboratory referenced CARB 429 Modified as the analytical procedure for sample analysis.
4. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

µg/kg = microgram per kilogram

RL = reporting limit

RPD = relative percent difference

EPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

J = Estimated detect data.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

UJ = Estimated non-detect data due to exceeded quality control criteria.

Table 2-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polycyclic Aromatic Hydrocarbons and
Alkylated Polycyclic Aromatic Hydrocarbons

| Location ID: Sample ID: Sample Date: | | | | | LPR8 LPR8-NPWB-COMP01 7/28/2010 | | | |
|--|-------------|-------|--------------------|----------|---------------------------------------|------------|-------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| 1,6,7-Trimethyl-naphthalene | 2245-38-7 | µg/kg | EPA 8270C/CARB 429 | 2.95 | 7.8 | 6 UJ | | 1.80 |
| 1-Methylnaphthalene | 90-12-0 | µg/kg | EPA 8270C/CARB 429 | 2.97 | 10.9 | 13 J | | 2.10 |
| 1-Methyl-phenanthrene | 832-69-9 | µg/kg | EPA 8270C/CARB 429 | 2.96 | 13.9 | 14 J | | 0.10 |
| 2,6-Dimethyl-naphthalene | 581-42-0 | µg/kg | EPA 8270C/CARB 429 | 2.95 | 7.73 | 4.8 J | | 2.93 |
| 2-Methylnaphthalene | 91-57-6 | µg/kg | EPA 8270C/CARB 429 | 2.95 | 9.04 | 13 J | | 3.96 |
| Acenaphthene | 83-32-9 | µg/kg | EPA 8270C/CARB 429 | 2.93 | 25.4 | 21 J | 19.0 | |
| Acenaphthylene | 208-96-8 | µg/kg | EPA 8270C/CARB 429 | 2.93 | 14.9 | 18 J | -18.8 | |
| Anthracene | 120-12-7 | µg/kg | EPA 8270C/CARB 429 | 2.95 | 24.7 | 38 J | -42.4 | |
| Benzo(a)anthracene | 56-55-3 | µg/kg | EPA 8270C/CARB 429 | 2.9 | 68.1 | 80 | -16.1 | |
| Benzo(a)pyrene | 50-32-8 | µg/kg | EPA 8270C/CARB 429 | 2.92 | 89.1 | 63 J | 34.3 | |
| Benzo(b)fluoranthene | 205-99-2 | µg/kg | EPA 8270C/CARB 429 | 2.91 | 94 | 71 J | 27.9 | |
| Benzo(g,h,i)perylene | 191-24-2 | µg/kg | EPA 8270C/CARB 429 | 2.85 | 67.5 | 37 | 58.4 | |
| Benzo(j,k)fluoranthene | 207-08-9-JK | µg/kg | EPA 8270C/CARB 429 | 6.14 | 83.7 | 54 | 43.1 | |
| Benzo[e]pyrene | 192-97-2 | µg/kg | EPA 8270C/CARB 429 | 2.9 | 79.2 | 100 | -23.2 | |
| Chrysene | 218-01-9 | µg/kg | EPA 8270C/CARB 429 | 2.98 | 111 | 120 J | -7.8 | |
| Dibenz(a,h)anthracene | 53-70-3 | µg/kg | EPA 8270C/CARB 429 | 2.91 | 15.7 | 14 J | 1.70 | |
| Dibenzothiophene (Synfuel) | 132-65-0 | µg/kg | EPA 8270C/CARB 429 | 3 | 7.6 | 4.9 J | 2.70 | |
| Fluoranthene | 206-44-0 | µg/kg | EPA 8270C/CARB 429 | 3.03 | 159 | 170 | -6.7 | |
| Fluorene | 86-73-7 | µg/kg | EPA 8270C/CARB 429 | 2.92 | 14.2 | 16 J | | 1.80 |
| Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/kg | EPA 8270C/CARB 429 | 2.87 | 67.6 | 48 J | 33.9 | |
| Naphthalene | 91-20-3 | µg/kg | EPA 8270C/CARB 429 | 2.99 | 11.6 | 11 J | | 0.60 |
| Perylene | 198-55-0 | µg/kg | EPA 8270C/CARB 429 | 2.95 | 20.4 | 16 J | 24.2 | |
| Phenanthrene | 85-01-8 | µg/kg | EPA 8270C/CARB 429 | 2.92 | 89.6 | 90 | -0.4 | |
| Pyrene | 129-00-0 | µg/kg | EPA 8270C/CARB 429 | 3.01 | 150 | 160 | -6.5 | |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

Table 2-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polycyclic Aromatic Hydrocarbons and
Alkylated Polycyclic Aromatic Hydrocarbons

Notes continued:

2. The EPA laboratory referenced EPA Method 8270C Modified as the analytical procedure for sample analysis.
3. The CPG laboratory referenced CARB 429 Modified as the analytical procedure for sample analysis.
4. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

µg/kg = microgram per kilogram

RL = reporting limit

RPD = relative percent difference

EPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

J = Estimated detect data.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

UJ = Estimated non-detect data due to exceeded quality control criteria.

Table 3-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Organochlorine Pesticides

| Location ID: Sample ID: Sample Date: | | | | | LPR2 LPR2-FHWB-COMP08 6/23/2010 | | | |
|--|------------|-------|-------------------|----------|---------------------------------------|------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Aldrin | 309-00-2 | µg/kg | EPA 1699 | 2.29 | 0.031 J | 0.013 U | | 0.02 |
| Alpha Endosulfan | 1959-98-8 | µg/kg | EPA 1699 | 0.183 | 0.0609 U | 0.23 U | | |
| Alpha-Chlordane | 5103-71-9 | µg/kg | EPA 1699 | 2.29 | 13.9 | 13 | 6.7 | |
| alpha-Hexachlorocyclohexane (alpha BHC) | 319-84-6 | µg/kg | EPA 1699 | 2.29 | 0.02 J-EMPC | 0.019 U | | 0.00 |
| Beta Endosulfan | 33213-65-9 | µg/kg | EPA 1699 | 0.183 | 0.0917 U | 0.66 U | | |
| Beta-Chlordane | 5103-74-2 | µg/kg | EPA 1699 | 2.29 | 4.74 | NR | | |
| beta-Hexachlorocyclohexane (beta BHC) | 319-85-7 | µg/kg | EPA 1699 | 2.29 | 0.045 J | 0.023 U | | 0.02 |
| cis-Nonachlor | 5103-73-1 | µg/kg | EPA 1699 | 2.29 | 5.16 | 5.5 | 0.34 | |
| delta-Hexachlorocyclohexane (delta BHC) | 319-86-8 | µg/kg | EPA 1699 | 0.215 | 0.007 J-EMPC | 0.035 U | | 0.028 |
| Dieldrin | 60-57-1 | µg/kg | EPA 1699 | 0.183 | 6.3 | 5 | 23.0 | |
| Endosulfan Sulfate | 1031-07-8 | µg/kg | EPA 1699 | 0.188 | 0.123 J | 0.032 U | | 0.091 |
| Endrin | 72-20-8 | µg/kg | EPA 1699 | 0.465 | 0.0891 U | 0.17 U | | |
| Endrin Aldehyde | 7421-93-4 | µg/kg | EPA 1699 | 0.189 | 0.0253 U | 0.16 U | | |
| Endrin Ketone | 53494-70-5 | µg/kg | EPA 1699 | 0.461 | 0.043 U | 0.094 U | | |
| Gamma BHC (Lindane) | 58-89-9 | µg/kg | EPA 1699 | 2.29 | 0.075 J | 0.047 J | | 0.03 |
| Gamma-Chlordane | 12789-03-6 | µg/kg | EPA 1699 | none | NR | 5.3 | | |
| Heptachlor | 76-44-8 | µg/kg | EPA 1699 | 1.16 | 0.012 J-EMPC | 0.013 UJ | | 0.00 |
| Heptachlor Epoxide | 1024-57-3 | µg/kg | EPA 1699 | 0.183 | 1.79 | 1.4 | 24.5 | |
| Hexachlorobenzene | 118-74-1 | µg/kg | EPA 1699 | 1.14 | 0.177 J | 0.19 J | | 0.01 |
| Methoxychlor | 72-43-5 | µg/kg | EPA 1699 | 0.471 | 0.0144 U | 0.45 U | | |
| O,P'-DDD | 53-19-0 | µg/kg | EPA 1699 | 1.17 | 0.724 J | 0.85 J | | 0.13 |
| O,P'-DDE | 3424-82-6 | µg/kg | EPA 1699 | 1.17 | 0.637 J | 0.61 UJ | | 0.03 |
| O,P'-DDT | 789-02-6 | µg/kg | EPA 1699 | 1.17 | 0.163 J | 0.74 UJ | | 0.58 |
| Oxychlordane | 27304-13-8 | µg/kg | EPA 1699 | 2.29 | 1.98 J | 2.5 J | | 0.52 |
| P,P'-DDD | 72-54-8 | µg/kg | EPA 1699 | 1.17 | 16.5 | 13 | 23.7 | |
| P,P'-DDE | 72-55-9 | µg/kg | EPA 1699 | 1.16 | 27.4 | 23 | 17.5 | |
| P,P'-DDT | 50-29-3 | ug/kg | EPA 1699 | 1.16 | 0.81 J | 0.75 UJ | | 0.06 |
| Technical Toxaphene | | ug/kg | EPA 1699 | none | 0.587 U | NR | | |
| trans-Nonachlor | 39765-80-5 | ug/kg | EPA 1699 | 2.29 | 13.1 | 4 | | 9.10 |

Table 3-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Organochlorine Pesticides

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

2. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

none = reporting limit was not provided with analytical data

NR = not reported

µg/kg = microgram per kilogram

RL = reporting limit

RPD = relative percent difference

EPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

J = Estimated detect data.

J-EMPC = Estimated detect data due to failure of one or more qualitative identification criteria.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

UJ = Estimated non-detect data due to exceeded quality control criteria.

Table 3-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Organochlorine Pesticides

| Location ID: Sample ID: Sample Date: | | | | | LPR3 LPR3-FHWB-COMP10 6/25/2010 | | | |
|--|------------|-------|-------------------|----------|---------------------------------------|------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | USEPA Result | CPG Result | % RPD | ABS |
| Aldrin | 309-00-2 | µg/kg | EPA 1699 | 2.31 | 0.044 J-EMPC | 0.0092 U | | 0.03 |
| Alpha Endosulfan | 1959-98-8 | µg/kg | EPA 1699 | 0.185 | 0.0507 U | 0.39 U | | |
| Alpha-Chlordane | 5103-71-9 | µg/kg | EPA 1699 | 2.31 | 18.7 | 18 | 3.8 | |
| alpha-Hexachlorocyclohexane (alpha BHC) | 319-84-6 | µg/kg | EPA 1699 | 2.31 | 0.03 J | 0.02 J | | 0.01 |
| Beta Endosulfan | 33213-65-9 | µg/kg | EPA 1699 | 0.185 | 0.0881 U | 0.55 U | | |
| Beta-Chlordane | 5103-74-2 | µg/kg | EPA 1699 | 2.31 | 6.87 | NR | | |
| beta-Hexachlorocyclohexane (beta BHC) | 319-85-7 | µg/kg | EPA 1699 | 2.31 | 0.058 J | 0.041 J | | 0.02 |
| cis-Nonachlor | 5103-73-1 | µg/kg | EPA 1699 | 2.31 | 7.01 | 6.1 | | 0.91 |
| delta-Hexachlorocyclohexane (delta BHC) | 319-86-8 | µg/kg | EPA 1699 | 0.218 | 0.008 J-EMPC | 0.025 U | | 0.017 |
| Dieldrin | 60-57-1 | µg/kg | EPA 1699 | 0.185 | 8.44 | 6.8 | 21.5 | |
| Endosulfan Sulfate | 1031-07-8 | µg/kg | EPA 1699 | 0.19 | 0.165 J | 0.2 J | | 0.04 |
| Endrin | 72-20-8 | µg/kg | EPA 1699 | 0.47 | 0.0674 U | 0.13 U | | |
| Endrin Aldehyde | 7421-93-4 | µg/kg | EPA 1699 | 0.192 | 0.0276 U | 0.054 U | | |
| Endrin Ketone | 53494-70-5 | µg/kg | EPA 1699 | 0.466 | 0.0296 U | 0.048 J | | 0.018 |
| Gamma BHC (Lindane) | 58-89-9 | µg/kg | EPA 1699 | 2.31 | 0.061 J | 0.064 J | | 0.00 |
| Gamma-Chlordane | 12789-03-6 | µg/kg | EPA 1699 | none | NR | 6.8 | | |
| Heptachlor | 76-44-8 | µg/kg | EPA 1699 | 1.17 | 0.01 J | 0.014 UJ | | 0.00 |
| Heptachlor Epoxide | 1024-57-3 | µg/kg | EPA 1699 | 0.185 | 2.18 | 1.9 | 13.7 | |
| Hexachlorobenzene | 118-74-1 | µg/kg | EPA 1699 | 1.16 | 0.209 J | 0.21 J | | 0.00 |
| Methoxychlor | 72-43-5 | µg/kg | EPA 1699 | 0.477 | 0.013 U | 0.28 U | | |
| O,P'-DDD | 53-19-0 | µg/kg | EPA 1699 | 1.19 | 1 J | 1.4 J | | 0.40 |
| O,P'-DDE | 3424-82-6 | µg/kg | EPA 1699 | 1.19 | 1.04 J | 1.2 J | | 0.16 |
| O,P'-DDT | 789-02-6 | µg/kg | EPA 1699 | 1.19 | 0.188 J | 0.54 UJ | | 0.35 |
| Oxychlordane | 27304-13-8 | µg/kg | EPA 1699 | 2.31 | 2.3 J | 2.5 J | | 0.20 |
| P,P'-DDD | 72-54-8 | µg/kg | EPA 1699 | 1.19 | 23.1 | 22 | 4.9 | |
| P,P'-DDE | 72-55-9 | µg/kg | EPA 1699 | 1.17 | 37.6 | 33 | 13.0 | |
| P,P'-DDT | 50-29-3 | ug/kg | EPA 1699 | 1.17 | 1.08 J | 1.1 J | | 0.02 |
| Technical Toxaphene | | ug/kg | EPA 1699 | none | 0.699 U | NR | | |
| trans-Nonachlor | 39765-80-5 | ug/kg | EPA 1699 | 2.31 | 19.2 | 5.6 | | 13.60 |

Table 3-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Organochlorine Pesticides

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

2. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

none = reporting limit was not provided with analytical data

NR = not reported

µg/kg = microgram per kilogram

RL = reporting limit

RPD = relative percent difference

USEPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

J = Estimated detect data.

J-EMPC = Estimated detect data due to failure of one or more qualitative identification criteria.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

UJ = Estimated non-detect data due to exceeded quality control criteria.

Table 3-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Organochlorine Pesticides

| Location ID: Sample ID: Sample Date: | | | | | LPR8 LPR8-NPWB-COMP01 7/28/2010 | | | |
|--|------------|-------|-------------------|----------|---------------------------------------|------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Aldrin | 309-00-2 | µg/kg | EPA 1699 | 2.25 | 0.168 J | 0.086 J | | 0.08 |
| Alpha Endosulfan | 1959-98-8 | µg/kg | EPA 1699 | 0.181 | 0.18 J | 1.1 U | | 0.92 |
| Alpha-Chlordane | 5103-71-9 | µg/kg | EPA 1699 | 2.25 | 40.3 | 33 | 19.9 | |
| alpha-Hexachlorocyclohexane (alpha BHC) | 319-84-6 | µg/kg | EPA 1699 | 2.25 | 0.022 J | 0.0063 U | | 0.02 |
| Beta Endosulfan | 33213-65-9 | µg/kg | EPA 1699 | 0.181 | 0.282 | 1 U | | 0.718 |
| Beta-Chlordane | 5103-74-2 | µg/kg | EPA 1699 | 2.25 | 19.2 | NR | | |
| beta-Hexachlorocyclohexane (beta BHC) | 319-85-7 | µg/kg | EPA 1699 | 2.25 | 0.043 J | 0.043 J | | 0.00 |
| cis-Nonachlor | 5103-73-1 | µg/kg | EPA 1699 | 2.25 | 9.84 | 9.5 | | 0.34 |
| delta-Hexachlorocyclohexane (delta BHC) | 319-86-8 | µg/kg | EPA 1699 | 0.213 | 0.005 J-EMPC | 0.011 J | | 0.006 |
| Dieldrin | 60-57-1 | µg/kg | EPA 1699 | 0.181 | 22.7 | 17 | 28.7 | |
| Endosulfan Sulfate | 1031-07-8 | µg/kg | EPA 1699 | 0.186 | 0.388 | 0.27 J | | 0.118 |
| Endrin | 72-20-8 | µg/kg | EPA 1699 | 0.461 | 0.167 J-EMPC | 0.69 U | | 0.523 |
| Endrin Aldehyde | 7421-93-4 | µg/kg | EPA 1699 | 0.188 | 0.018 U | 0.22 U | | |
| Endrin Ketone | 53494-70-5 | µg/kg | EPA 1699 | 0.457 | 0.095 J-EMPC | 0.08 J | | 0.015 |
| Gamma BHC (Lindane) | 58-89-9 | µg/kg | EPA 1699 | 2.25 | 0.089 J | 0.078 J | | 0.01 |
| Gamma-Chlordane | 12789-03-6 | µg/kg | EPA 1699 | none | NR | 16 | | |
| Heptachlor | 76-44-8 | µg/kg | EPA 1699 | 1.14 | 0.102 J | 0.099 J | | 0.00 |
| Heptachlor Epoxide | 1024-57-3 | µg/kg | EPA 1699 | 0.182 | 8.65 | 6.6 | 26.9 | |
| Hexachlorobenzene | 118-74-1 | µg/kg | EPA 1699 | 1.13 | 1.08 J | 1.4 J | | 0.32 |
| Methoxychlor | 72-43-5 | µg/kg | EPA 1699 | 0.467 | 0.104 J-EMPC | 0.52 U | | 0.416 |
| O,P'-DDD | 53-19-0 | µg/kg | EPA 1699 | 1.15 | 4.5 | 5.6 | | 1.10 |
| O,P'-DDE | 3424-82-6 | µg/kg | EPA 1699 | 1.15 | 1.85 | 1.9 J | | 0.05 |
| O,P'-DDT | 789-02-6 | µg/kg | EPA 1699 | 1.15 | 1.03 J | 0.77 J | | 0.26 |
| Oxychlordane | 27304-13-8 | µg/kg | EPA 1699 | 2.25 | 4.31 | 4.3 J | | 0.01 |
| P,P'-DDD | 72-54-8 | µg/kg | EPA 1699 | 1.15 | 19.2 | 19 | | 0.20 |
| P,P'-DDE | 72-55-9 | µg/kg | EPA 1699 | 1.14 | 32.3 | 27 | 17.9 | |
| P,P'-DDT | 50-29-3 | ug/kg | EPA 1699 | 1.14 | 2.38 | 2.1 | | 0.28 |
| Technical Toxaphene | | ug/kg | EPA 1699 | none | 1.47 U | NR | | |
| trans-Nonachlor | 39765-80-5 | ug/kg | EPA 1699 | 2.25 | 28.9 | 17 | | 11.9 |

Table 3-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Organochlorine Pesticides

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.

2. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

none = reporting limit was not provided with analytical data

NR = not reported

µg/kg = microgram per kilogram

RL = reporting limit

RPD = relative percent difference

EPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

J = Estimated detect data.

J-EMPC = Estimated detect data due to failure of one or more qualitative identification criteria.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

Table 4-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP14 8/9/2010 | | | |
|--|------------|------|-------------------|----------|--------------------------------------|------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Chlorobiphenyl; 2- | 2051-60-7 | pg/g | EPA 1668A | 19.7 | 47.7 | 63 | | 15.3 |
| Chlorobiphenyl; 3- | 2051-61-8 | pg/g | EPA 1668A | 19.7 | 19.7 U | 5 | | 14.7 |
| Chlorobiphenyl; 4- | 2051-62-9 | pg/g | EPA 1668A | 113 | 113 U | 9.3 | | 103.7 |
| Decachlorobiphenyl | 2051-24-3 | pg/g | EPA 1668A | 19.7 | 501 | 860 J | -52.8 | |
| Dichlorobiphenyl; 2,2'- | 13029-08-8 | pg/g | EPA 1668A | 19.7 | 547 | 890 | -47.7 | |
| Dichlorobiphenyl; 2,3' | 25569-80-6 | pg/g | EPA 1668A | 19.7 | 184 | 260 | -34.2 | |
| Dichlorobiphenyl; 2,3- | 16605-91-7 | pg/g | EPA 1668A | 19.7 | 19.7 U | 8.6 J | | 11.1 |
| Dichlorobiphenyl; 2,4' | 34883-43-7 | pg/g | EPA 1668A | 197 | 566 | 830 | | 264 |
| Dichlorobiphenyl; 2,4- | 33284-50-3 | pg/g | EPA 1668A | 19.7 | 19.7 U | 22 | | 2.3 |
| Dichlorobiphenyl; 2,5- | 34883-39-1 | pg/g | EPA 1668A | 19.7 | 25.8 | 36 | | 10.2 |
| Dichlorobiphenyl; 2,6- | 33146-45-1 | pg/g | EPA 1668A | 19.7 | 31.6 | 38 | | 6.4 |
| Dichlorobiphenyl; 3,3' | 2050-67-1 | pg/g | EPA 1668A | 984 | 984 U | 210 | | 774 |
| Dichlorobiphenyl; 3,4' | 2974-90-5 | pg/g | EPA 1668A | 78.7 | C12 | C12 | | |
| Dichlorobiphenyl; 3,4- | 2974-92-7 | pg/g | EPA 1668A | 78.7 | 78.7 CU | 42 C | | 36.7 |
| Dichlorobiphenyl; 3,5- | 34883-41-5 | pg/g | EPA 1668A | 19.7 | 19.7 U | 1.7 U | | 18 |
| Dichlorobiphenyl; 4,4' | 2050-68-2 | pg/g | EPA 1668A | 197 | 237 | 310 | | 73 |
| Heptachlorobiphenyl; 2,2',3,3',4,4',5- | 35065-30-6 | pg/g | EPA 1668A | 19.7 | 7590 | 14000 J | -59.4 | |
| Heptachlorobiphenyl; 2,2',3,3',4,4',6- | 52663-71-5 | pg/g | EPA 1668A | 39.4 | 2490 C | 3300 C | -28.0 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,5'- | 52663-74-8 | pg/g | EPA 1668A | 39.4 | 1620 | 2000 | -21.0 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,6'- | 38411-25-5 | pg/g | EPA 1668A | 39.4 | 7080 | 9700 J | -31.2 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,6- | 68194-16-1 | pg/g | EPA 1668A | 39.4 | C171 | C171 | | |
| Heptachlorobiphenyl; 2,2',3,3',4,5',6'- | 52663-70-4 | pg/g | EPA 1668A | 39.4 | 5540 | 7000 | -23.3 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5',6- | 40186-70-7 | pg/g | EPA 1668A | 19.7 | 432 | 610 | -34.2 | |
| Heptachlorobiphenyl; 2,2',3,3',4,6,6'- | 52663-65-7 | pg/g | EPA 1668A | 19.7 | 901 | 1400 | -43.4 | |
| Heptachlorobiphenyl; 2,2',3,3',5,5',6- | 52663-67-9 | pg/g | EPA 1668A | 19.7 | 2440 | 3200 | -27.0 | |
| Heptachlorobiphenyl; 2,2',3,3',5,6,6'- | 52663-64-6 | pg/g | EPA 1668A | 19.7 | 2100 | 2900 | -32.0 | |
| Heptachlorobiphenyl; 2,2',3,4,4',5,5'- | 35065-29-3 | pg/g | EPA 1668A | 39.4 | 22800 C | 42000 JC | -59.3 | |
| Heptachlorobiphenyl; 2,2',3,4,4',5,6'- | 60145-23-5 | pg/g | EPA 1668A | 19.7 | 69.6 | 120 | | 50.4 |
| Heptachlorobiphenyl; 2,2',3,4,4',5,6- | 74472-47-2 | pg/g | EPA 1668A | 19.7 | 72.4 | 120 | | 47.6 |

Table 4-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP14 8/9/2010 | | | |
|--|------------|------|-------------------|----------|--------------------------------------|------------|-------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Heptachlorobiphenyl; 2,2',3,4,4',5',6- | 52663-69-1 | pg/g | EPA 1668A | 39.4 | 7500 C | 8800 J | -16.0 | |
| Heptachlorobiphenyl; 2,2',3,4,4',6,6'- | 74472-48-3 | pg/g | EPA 1668A | 19.7 | 35.8 | 58 | | 22.2 |
| Heptachlorobiphenyl; 2,2',3,4,5,5',6- | 52712-05-7 | pg/g | EPA 1668A | 39.4 | C183 | 1100 | | |
| Heptachlorobiphenyl; 2,2',3,4',5,5',6- | 52663-68-0 | pg/g | EPA 1668A | 39.4 | 15700 | 21000 J | -28.9 | |
| Heptachlorobiphenyl; 2,2',3,4,5,6,6'- | 74472-49-4 | pg/g | EPA 1668A | 19.7 | 19.7 U | 2.6 | | 17.1 |
| Heptachlorobiphenyl; 2,2',3,4',5,6,6'- | 74487-85-7 | pg/g | EPA 1668A | 19.7 | 43.2 | 74 | | 30.8 |
| Heptachlorobiphenyl; 2,3,3',4,4',5,5'- | 39635-31-9 | pg/g | EPA 1668A | 19.7 | 285 | 440 | -42.8 | |
| Heptachlorobiphenyl; 2,3,3',4,4',5,6- | 41411-64-7 | pg/g | EPA 1668A | 19.7 | 1780 | 2600 | -37.4 | |
| Heptachlorobiphenyl; 2,3,3',4,4',5',6- | 74472-50-7 | pg/g | EPA 1668A | 19.7 | 379 | 540 | -35.0 | |
| Heptachlorobiphenyl; 2,3,3',4,5,5',6- | 74472-51-8 | pg/g | EPA 1668A | 39.4 | 39.4 U | 3.4 U | | |
| Heptachlorobiphenyl; 2,3,3',4',5,5',6- | 69782-91-8 | pg/g | EPA 1668A | 39.4 | C180 | JC180 | | |
| Hexachlorobiphenyl; 2,3',4,4',5,5' | 52663-72-6 | pg/g | EPA 1668A | 19.7 | 1050 | 1700 | -47.3 | |
| Hexachlorobiphenyl; 2,2',3,3',4,4'- | 38380-07-3 | pg/g | EPA 1668A | 39.4 | 2820 C | 3900 C | -32.1 | |
| Hexachlorobiphenyl; 2,2',3,3',4,5'- | 52663-66-8 | pg/g | EPA 1668A | 19.7 | 1440 | 2000 | -32.6 | |
| Hexachlorobiphenyl; 2,2',3,3',4,5- | 55215-18-4 | pg/g | EPA 1668A | 59.1 | 27700 C | 39000 JC | -33.9 | |
| Hexachlorobiphenyl; 2,2',3,3',4,6'- | 38380-05-1 | pg/g | EPA 1668A | 19.7 | 4950 | 6400 | -25.6 | |
| Hexachlorobiphenyl; 2,2',3,3',4,6- | 61798-70-7 | pg/g | EPA 1668A | 19.7 | 80.2 | 110 | -31.3 | |
| Hexachlorobiphenyl; 2,2',3,3',5,5'- | 35694-04-3 | pg/g | EPA 1668A | 19.7 | 661 | 940 | -34.9 | |
| Hexachlorobiphenyl; 2,2',3,3',5,6'- | 52744-13-5 | pg/g | EPA 1668A | 39.4 | 9430 C | 13000 C | -31.8 | |
| Hexachlorobiphenyl; 2,2',3,3',5,6- | 52704-70-8 | pg/g | EPA 1668A | 19.7 | 772 | 1200 | -43.4 | |
| Hexachlorobiphenyl; 2,2',3,3',6,6'- | 38411-22-2 | pg/g | EPA 1668A | 19.7 | 1540 | 2500 | -47.5 | |
| Hexachlorobiphenyl; 2,2',3,4,4',5'- | 35065-28-2 | pg/g | EPA 1668A | 59.1 | C129 | JC129 | | |
| Hexachlorobiphenyl; 2,2',3,4,4',5- | 35694-06-5 | pg/g | EPA 1668A | 19.7 | 1010 | 1500 | -39.0 | |
| Hexachlorobiphenyl; 2,2',3,4,4',6'- | 59291-64-4 | pg/g | EPA 1668A | 39.4 | C139 | C139 | | |
| Hexachlorobiphenyl; 2,2',3,4,4',6- | 56030-56-9 | pg/g | EPA 1668A | 39.4 | 491 C | 780 C | -45.5 | |
| Hexachlorobiphenyl; 2,2',3,4,5,5'- | 52712-04-6 | pg/g | EPA 1668A | 19.7 | 5060 | 6400 | -23.4 | |
| Hexachlorobiphenyl; 2,2',3,4',5,5'- | 51908-16-8 | pg/g | EPA 1668A | 19.7 | 5790 | 7400 | -24.4 | |
| Hexachlorobiphenyl; 2,2',3,4,5,6'- | 68194-15-0 | pg/g | EPA 1668A | 19.7 | 19.7 U | 80 | | 60.3 |
| Hexachlorobiphenyl; 2,2',3,4,5,6- | 41411-61-4 | pg/g | EPA 1668A | 19.7 | 19.7 U | 0.98 U | | |

Table 4-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP14 8/9/2010 | | | |
|--|------------|------|-------------------|----------|--------------------------------------|------------|-------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Hexachlorobiphenyl; 2,2',3,4,5',6- | 68194-14-9 | pg/g | EPA 1668A | 19.7 | 1180 | 1800 | -41.6 | |
| Hexachlorobiphenyl; 2,2',3,4',5,6'- | 74472-41-6 | pg/g | EPA 1668A | 19.7 | 165 | 270 | -48.3 | |
| Hexachlorobiphenyl; 2,2',3,4',5,6- | 68194-13-8 | pg/g | EPA 1668A | 39.4 | 20000 C | 28000 JC | -33.3 | |
| Hexachlorobiphenyl; 2,2',3,4',5',6- | 38380-04-0 | pg/g | EPA 1668A | 39.4 | C147 | JC147 | | |
| Hexachlorobiphenyl; 2,2',3,4,6,6'- | 74472-40-5 | pg/g | EPA 1668A | 19.7 | 19.7 U | 7.5 | | 12.2 |
| Hexachlorobiphenyl; 2,2',3,4',6,6'- | 68194-08-1 | pg/g | EPA 1668A | 19.7 | 101 | 190 | -61.2 | |
| Hexachlorobiphenyl; 2,2',3,5,5',6- | 52663-63-5 | pg/g | EPA 1668A | 39.4 | C135 | C135 | | |
| Hexachlorobiphenyl; 2,2',3,5,6,6'- | 68194-09-2 | pg/g | EPA 1668A | 19.7 | 19.7 U | 44 | | 24.3 |
| Hexachlorobiphenyl; 2,2',4,4',5,5'- | 35065-27-1 | pg/g | EPA 1668A | 39.4 | 32600 C | 56000 JC | -52.8 | |
| Hexachlorobiphenyl; 2,2',4,4',5,6'- | 60145-22-4 | pg/g | EPA 1668A | 19.7 | 1010 | 1600 | -45.2 | |
| Hexachlorobiphenyl; 2,2',4,4',6,6'- | 33979-03-2 | pg/g | EPA 1668A | 19.7 | 351 | 620 | -55.4 | |
| Hexachlorobiphenyl; 2,3,3',4,4',5'- | 69782-90-7 | pg/g | EPA 1668A | 39.4 | C156 | C156 | | |
| Hexachlorobiphenyl; 2,3,3',4,4',5- | 38380-08-4 | pg/g | EPA 1668A | 39.4 | 2500 C | 3900 C | -43.8 | |
| Hexachlorobiphenyl; 2,3,3',4,4',6- | 74472-42-7 | pg/g | EPA 1668A | 19.7 | 2440 | 3300 | -30.0 | |
| Hexachlorobiphenyl; 2,3,3',4,5,5'- | 39635-35-3 | pg/g | EPA 1668A | 19.7 | 225 | 350 | -43.5 | |
| Hexachlorobiphenyl; 2,3,3',4',5,5'- | 39635-34-2 | pg/g | EPA 1668A | 19.7 | 79 | 160 EMPC-J | | 81.0 |
| Hexachlorobiphenyl; 2,3,3',4,5,6- | 41411-62-5 | pg/g | EPA 1668A | 19.7 | 19.7 U | 0.72 U | | |
| Hexachlorobiphenyl; 2,3,3',4,5',6- | 74472-43-8 | pg/g | EPA 1668A | 19.7 | 19.7 U | 0.64 U | | |
| Hexachlorobiphenyl; 2,3,3',4',5,6- | 74472-44-9 | pg/g | EPA 1668A | 59.1 | C129 | JC129 | | |
| Hexachlorobiphenyl; 2,3,3',4',5',6- | 74472-45-0 | pg/g | EPA 1668A | 19.7 | 1600 | 1900 | -17.1 | |
| Hexachlorobiphenyl; 2,3,3',5,5',6- | 74472-46-1 | pg/g | EPA 1668A | 19.7 | 19.7 U | 31 | | 11.3 |
| Hexachlorobiphenyl; 2,3,4,4',5,6- | 41411-63-6 | pg/g | EPA 1668A | 39.4 | C128 | C128 | | |
| Hexachlorobiphenyl; 2,3',4,4',5,6- | 59291-65-5 | pg/g | EPA 1668A | 39.4 | C153 | JC153 | | |
| Hexachlorobiphenyl; 3,3',4,4',5,5'- | 32774-16-6 | pg/g | EPA 1668A | 152 | 152 U | 7.3 U | | |
| Nonachlorobiphenyl; 2,2',3,3',4,4',5,5',6- | 40186-72-9 | pg/g | EPA 1668A | 39.4 | 1290 | 2100 J | -47.8 | |
| Nonachlorobiphenyl; 2,2',3,3',4,4',5,6,6'- | 52663-79-3 | pg/g | EPA 1668A | 39.4 | 202 | 250 | -21.2 | |
| Nonachlorobiphenyl; 2,2',3,3',4,5,5',6,6'- | 52663-77-1 | pg/g | EPA 1668A | 19.7 | 496 | 840 | -51.5 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,5'- | 35694-08-7 | pg/g | EPA 1668A | 19.7 | 3800 | 5500 | -36.6 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,6'- | 42740-50-1 | pg/g | EPA 1668A | 39.4 | 2540 | 3500 | -31.8 | |

Table 4-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP14 8/9/2010 | | | |
|--|------------|------|-------------------|----------|--------------------------------------|------------|--------------|-------------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,6- | 52663-78-2 | pg/g | EPA 1668A | 19.7 | 1680 | 2400 | -35.3 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',6,6'- | 33091-17-7 | pg/g | EPA 1668A | 78.7 | 569 C | 230 | 84.9 | |
| Octachlorobiphenyl; 2,2',3,3',4,5,5',6'- | 52663-75-9 | pg/g | EPA 1668A | 39.4 | C198 | C198 | | |
| Octachlorobiphenyl; 2,2',3,3',4,5,5',6- | 68194-17-2 | pg/g | EPA 1668A | 39.4 | 5320 C | 7200 C | -30.0 | |
| Octachlorobiphenyl; 2,2',3,3',4,5,6,6'- | 52663-73-7 | pg/g | EPA 1668A | 78.7 | C197 | 590 | | |
| Octachlorobiphenyl; 2,2',3,3',4,5',6,6'- | 40186-71-8 | pg/g | EPA 1668A | 19.7 | 693 | 940 | -30.3 | |
| Octachlorobiphenyl; 2,2',3,3',5,5',6,6'- | 2136-99-4 | pg/g | EPA 1668A | 19.7 | 1140 | 1900 | -50.0 | |
| Octachlorobiphenyl; 2,2',3,4,4',5,5',6- | 52663-76-0 | pg/g | EPA 1668A | 19.7 | 3200 | 4700 | -38.0 | |
| Octachlorobiphenyl; 2,2',3,4,4',5,6,6'- | 74472-52-9 | pg/g | EPA 1668A | 19.7 | 19.7 U | 5.5 | | 14.2 |
| Octachlorobiphenyl; 2,3,3',4,4',5,5',6- | 74472-53-0 | pg/g | EPA 1668A | 19.7 | 188 | 320 | -52.0 | |
| PCB Congener | 38380-05-8 | pg/g | EPA 1668A | 19.7 | 529000 | 780000 | -38.3 | |
| Pentachlorobiphenyl; 2,2',3,3',4- | 52663-62-4 | pg/g | EPA 1668A | 19.7 | 986 | 1500 | -41.4 | |
| Pentachlorobiphenyl; 2,3,4,5,6- | 18259-05-7 | pg/g | EPA 1668A | 59.1 | C85 | C85 | | |
| Pentachlorobiphenyl; 2,2',3,3',5- | 60145-20-2 | pg/g | EPA 1668A | 19.7 | 769 | 1200 | -43.8 | |
| Pentachlorobiphenyl; 2,2',3,3',6- | 52663-60-2 | pg/g | EPA 1668A | 19.7 | 2010 | 3000 | -39.5 | |
| Pentachlorobiphenyl; 2,2',3,4,4'- | 65510-45-4 | pg/g | EPA 1668A | 59.1 | 3950 C | 6000 C | -41.2 | |
| Pentachlorobiphenyl; 2,2',3,4,5'- | 38380-02-8 | pg/g | EPA 1668A | 118 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,2',3,4,5- | 55312-69-1 | pg/g | EPA 1668A | 118 | 11200 C | 18000 C | -46.6 | |
| Pentachlorobiphenyl; 2,2',3,4',5'- | 41464-51-1 | pg/g | EPA 1668A | 118 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,2',3,4',5- | 68194-07-0 | pg/g | EPA 1668A | 59.1 | 21800 C | 34000 JC | -43.7 | |
| Pentachlorobiphenyl; 2,2',3,4,6'- | 73575-57-2 | pg/g | EPA 1668A | 19.7 | 184 | 270 | -37.9 | |
| Pentachlorobiphenyl; 2,2',3,4,6- | 55215-17-3 | pg/g | EPA 1668A | 39.4 | 3260 C | 1.5 U | | 3259 |
| Pentachlorobiphenyl; 2,2',3,4',6'- | 60233-25-2 | pg/g | EPA 1668A | 39.4 | 1260 C | 1.1 U | | 1259 |
| Pentachlorobiphenyl; 2,2',3,4',6- | 68194-05-8 | pg/g | EPA 1668A | 39.4 | C88 | 5200 | | |
| Pentachlorobiphenyl; 2,2',3,5,5'- | 52663-61-3 | pg/g | EPA 1668A | 19.7 | 4880 | 7500 | -42.3 | |
| Pentachlorobiphenyl; 2,2',3,5,6'- | 73575-55-0 | pg/g | EPA 1668A | 19.7 | 246 | 440 | -56.6 | |
| Pentachlorobiphenyl; 2,2',3,5,6- | 73575-56-1 | pg/g | EPA 1668A | 39.4 | 2540 C | 3800 C | -39.7 | |
| Pentachlorobiphenyl; 2,2',3,5',6- | 38379-99-6 | pg/g | EPA 1668A | 19.7 | 11400 | 17000 J | -39.4 | |
| Pentachlorobiphenyl; 2,2',3,6,6'- | 73575-54-9 | pg/g | EPA 1668A | 19.7 | 108 | 170 | -44.6 | |

Table 4-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP14 8/9/2010 | | | |
|--|------------|------|-------------------|----------|--------------------------------------|------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Pentachlorobiphenyl; 2,2',4,4',5- | 38380-01-7 | pg/g | EPA 1668A | 19.7 | 13300 | 19000 J | -35.3 | |
| Pentachlorobiphenyl; 2,2',4,4',6- | 39485-83-1 | pg/g | EPA 1668A | 39.4 | C93 | C93 | | |
| Pentachlorobiphenyl; 2,2',4,5,5'- | 37680-73-2 | pg/g | EPA 1668A | 59.1 | C90 | JC90 | | |
| Pentachlorobiphenyl; 2,2',4,5,6'- | 68194-06-9 | pg/g | EPA 1668A | 39.4 | C98 | 2200 | | |
| Pentachlorobiphenyl; 2,2',4,5',6- | 60145-21-3 | pg/g | EPA 1668A | 19.7 | 848 | 1200 | -34.4 | |
| Pentachlorobiphenyl; 2,2',4,6,6'- | 56558-16-8 | pg/g | EPA 1668A | 19.7 | 221 | 360 | -47.8 | |
| Pentachlorobiphenyl; 2,3,3',4,4'- | 32598-14-4 | pg/g | EPA 1668A | 39.4 | 6260 | 10000 J | -46.0 | |
| Pentachlorobiphenyl; 2,3,3',4,5'- | 70362-41-3 | pg/g | EPA 1668A | 39.4 | 359 C | 520 C | -36.6 | |
| Pentachlorobiphenyl; 2,3,3',4,5- | 70424-69-0 | pg/g | EPA 1668A | 19.7 | 19.7 U | 0.82 U | | |
| Pentachlorobiphenyl; 2,3,3',4',5'- | 76842-07-4 | pg/g | EPA 1668A | 19.7 | 26.9 | 61 | 34.1 | |
| Pentachlorobiphenyl; 2,3,3',4',5- | 70424-68-9 | pg/g | EPA 1668A | 19.7 | 1430 | 1900 | -28.2 | |
| Pentachlorobiphenyl; 2,3,3',4,6- | 74472-35-8 | pg/g | EPA 1668A | 118 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,3,3',4',6- | 38380-03-9 | pg/g | EPA 1668A | 39.4 | 18600 C | 28000 J | -40.3 | |
| Pentachlorobiphenyl; 2,3,3',5,5'- | 39635-32-0 | pg/g | EPA 1668A | 19.7 | 28.2 | 50 | 21.8 | |
| Pentachlorobiphenyl; 2,3,3',5,6- | 74472-36-9 | pg/g | EPA 1668A | 19.7 | 69.1 | 0.89 U | | 68.21 |
| Pentachlorobiphenyl; 2,3,3',5',6- | 68194-10-5 | pg/g | EPA 1668A | 59.1 | C90 | JC90 | | |
| Pentachlorobiphenyl; 2,3,4,4',5- | 74472-37-0 | pg/g | EPA 1668A | 19.7 | 456 | 760 | -50.0 | |
| Pentachlorobiphenyl; 2,3',4,4',5'- | 65510-44-3 | pg/g | EPA 1668A | 39.4 | 333 | 590 | -55.7 | |
| Pentachlorobiphenyl; 2,3',4,4',5- | 31508-00-6 | pg/g | EPA 1668A | 39.4 | 19000 | 28000 J | -38.3 | |
| Pentachlorobiphenyl; 2,3,4,4',6- | 74472-38-1 | pg/g | EPA 1668A | 39.4 | C110 | 420 | | |
| Pentachlorobiphenyl; 2,3',4,4',6- | 56558-17-9 | pg/g | EPA 1668A | 118 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,3',4,5,5'- | 68194-12-7 | pg/g | EPA 1668A | 19.7 | 19.7 U | 190 | | 170.3 |
| Pentachlorobiphenyl; 2,3',4',5,5'- | 70424-70-3 | pg/g | EPA 1668A | 39.4 | C108 | C108 | | |
| Pentachlorobiphenyl; 2,3,4',5,6- | 68194-11-6 | pg/g | EPA 1668A | 59.1 | C85 | 940 | | |
| Pentachlorobiphenyl; 2,3',4,5',6- | 56558-18-0 | pg/g | EPA 1668A | 19.7 | 33.9 | 61 | | 27.1 |
| Pentachlorobiphenyl; 2,3',4',5',6- | 74472-39-2 | pg/g | EPA 1668A | 118 | C86 | C86 | | |
| Pentachlorobiphenyl; 3,3',4,4',5- | 57465-28-8 | pg/g | EPA 1668A | 19.7 | 49.5 | 82 | | 32.5 |
| Pentachlorobiphenyl; 3,3',4,5,5'- | 39635-33-1 | pg/g | EPA 1668A | 19.7 | 46 | 0.91 U | | 45.09 |
| Tetrachlorobiphenyl, 2,3,4,5- | 33284-53-6 | pg/g | EPA 1668A | 157 | 18600 C | 27000 C | -36.8 | |

Table 4-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP14 8/9/2010 | | | |
|--|------------|------|-------------------|----------|--------------------------------------|------------|--------------|-----|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Tetrachlorobiphenyl; 2,2',3,3'- | 38444-93-8 | pg/g | EPA 1668A | 19.7 | 6490 C | 8700 C | -29.1 | |
| Tetrachlorobiphenyl; 2,2',3,4'- | 36559-22-5 | pg/g | EPA 1668A | 19.7 | 3830 | 5800 | -40.9 | |
| Tetrachlorobiphenyl; 2,2',3,4- | 52663-59-9 | pg/g | EPA 1668A | 39.4 | 482 | 830 | -53.0 | |
| Tetrachlorobiphenyl; 2,2',3,5'- | 41464-39-5 | pg/g | EPA 1668A | 59.1 | 25100 C | 36000 JC | -35.7 | |
| Tetrachlorobiphenyl; 2,2',3,5- | 70362-46-8 | pg/g | EPA 1668A | 19.7 | 729 | 840 | -14.1 | |
| Tetrachlorobiphenyl; 2,2',3,6'- | 41464-47-5 | pg/g | EPA 1668A | 19.7 | 410 | 460 | -11.5 | |
| Tetrachlorobiphenyl; 2,2',3,6- | 70362-45-7 | pg/g | EPA 1668A | 39.4 | 6000 C | 1300 | 128.8 | |
| Tetrachlorobiphenyl; 2,2',4,4'- | 2437-79-8 | pg/g | EPA 1668A | 59.1 | C44 | JC44 | | |
| Tetrachlorobiphenyl; 2,2',4,5'- | 41464-40-8 | pg/g | EPA 1668A | 39.4 | 14100 C | 21000 JC | -39.3 | |
| Tetrachlorobiphenyl; 2,2',4,5- | 70362-47-9 | pg/g | EPA 1668A | 19.7 | 983 | 1200 | -19.9 | |
| Tetrachlorobiphenyl; 2,2',4,6'- | 68194-04-7 | pg/g | EPA 1668A | 39.4 | C45 | 7800 | | |
| Tetrachlorobiphenyl; 2,2',4,6- | 62796-65-0 | pg/g | EPA 1668A | 39.4 | 2480 C | 4300 C | -53.7 | |
| Tetrachlorobiphenyl; 2,2',5,5'- | 35693-99-3 | pg/g | EPA 1668A | 39.4 | 18000 | 24000 J | -28.6 | |
| Tetrachlorobiphenyl; 2,2',5,6'- | 41464-41-9 | pg/g | EPA 1668A | 39.4 | C50 | C50 | | |
| Tetrachlorobiphenyl; 2,2',6,6'- | 15968-05-5 | pg/g | EPA 1668A | 19.7 | 244 | 420 | -53.0 | |
| Tetrachlorobiphenyl; 2,3,3',4'- | 41464-43-1 | pg/g | EPA 1668A | 197 | 1770 | 2400 | -30.2 | |
| Tetrachlorobiphenyl; 2,3,3',4- | 74338-24-2 | pg/g | EPA 1668A | 19.7 | 229 | 100 | 78.4 | |
| Tetrachlorobiphenyl; 2,3,3',5'- | 41464-49-7 | pg/g | EPA 1668A | 19.7 | 19.7 U | 43 | 23.3 | |
| Tetrachlorobiphenyl; 2,3,3',5- | 70424-67-8 | pg/g | EPA 1668A | 19.7 | 41.9 | 80 | 38.1 | |
| Tetrachlorobiphenyl; 2,3,3',6- | 74472-33-6 | pg/g | EPA 1668A | 59.1 | 1560 C | 2200 C | -34.0 | |
| Tetrachlorobiphenyl; 2,3,4,4'- | 33025-41-1 | pg/g | EPA 1668A | 39.4 | 2540 | 3600 | -34.5 | |
| Tetrachlorobiphenyl; 2,3',4,4'- | 32598-10-0 | pg/g | EPA 1668A | 197 | 15900 | 21000 J | -27.6 | |
| Tetrachlorobiphenyl; 2,3,4',5- | 74472-34-7 | pg/g | EPA 1668A | 19.7 | 789 | 1200 | -41.3 | |
| Tetrachlorobiphenyl; 2,3',4,5'- | 73575-52-7 | pg/g | EPA 1668A | 19.7 | 250 | 430 | -52.9 | |
| Tetrachlorobiphenyl; 2,3',4,5- | 73575-53-8 | pg/g | EPA 1668A | 39.4 | 151 | 220 | -37.2 | |
| Tetrachlorobiphenyl; 2,3',4',5'- | 70362-48-0 | pg/g | EPA 1668A | 157 | C61 | C61 | | |
| Tetrachlorobiphenyl; 2,3',4',5- | 32598-11-1 | pg/g | EPA 1668A | 157 | C61 | C61 | | |
| Tetrachlorobiphenyl; 2,3,4,6- | 54230-22-7 | pg/g | EPA 1668A | 59.1 | C59 | C59 | | |
| Tetrachlorobiphenyl; 2,3,4',6- | 52663-58-8 | pg/g | EPA 1668A | 39.4 | 8220 | 12000 J | -37.4 | |

Table 4-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP14 8/9/2010 | | | |
|--|------------|------|-------------------|----------|--------------------------------------|------------|-------|-----|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Tetrachlorobiphenyl; 2,3',4,6- | 60233-24-1 | pg/g | EPA 1668A | 39.4 | C49 | JC49 | | |
| Tetrachlorobiphenyl; 2,3',4',6- | 41464-46-4 | pg/g | EPA 1668A | 19.7 | C40 | C40 | | |
| Tetrachlorobiphenyl; 2,3',5,5'- | 41464-42-0 | pg/g | EPA 1668A | 19.7 | 234 | 380 | -47.6 | |
| Tetrachlorobiphenyl; 2,3,5,6- | 33284-54-7 | pg/g | EPA 1668A | 59.1 | C44 | JC44 | | |
| Tetrachlorobiphenyl; 2,3',5'-6- | 74338-23-1 | pg/g | EPA 1668A | 19.7 | 322 | 230 | 33.3 | |
| Tetrachlorobiphenyl; 2,4,4',5- | 32690-93-0 | pg/g | EPA 1668A | 157 | C61 | C61 | | |
| Tetrachlorobiphenyl; 2,4,4',6- | 32598-12-2 | pg/g | EPA 1668A | 59.1 | C59 | C59 | | |
| Tetrachlorobiphenyl; 3,3',4,4'- | 32598-13-3 | pg/g | EPA 1668A | 39.4 | 516 | 810 | -44.3 | |
| Tetrachlorobiphenyl; 3,3',4,5'- | 41464-48-6 | pg/g | EPA 1668A | 19.7 | 74.3 | 160 | -73.2 | |
| Tetrachlorobiphenyl; 3,3',4,5- | 70362-49-1 | pg/g | EPA 1668A | 19.7 | 90.8 | 2.3 U | 88.5 | |
| Tetrachlorobiphenyl; 3,3',5,5'- | 33284-52-5 | pg/g | EPA 1668A | 19.7 | 97.8 | 2.4 U | 95.4 | |
| Tetrachlorobiphenyl; 3,4,4',5- | 70362-50-4 | pg/g | EPA 1668A | 39.4 | 39.4 U | 64 | 24.6 | |
| Trichlorobiphenyl; 2,2',3- | 38444-78-9 | pg/g | EPA 1668A | 19.7 | 1100 | 1900 | -53.3 | |
| Trichlorobiphenyl; 2,2',4- | 37680-66-3 | pg/g | EPA 1668A | 19.7 | 2460 | 3800 | -42.8 | |
| Trichlorobiphenyl; 2,2',5- | 37680-65-2 | pg/g | EPA 1668A | 39.4 | 3440 C | 5800 C | -51.1 | |
| Trichlorobiphenyl; 2,2',6- | 38444-73-4 | pg/g | EPA 1668A | 19.7 | 541 | 1000 | -59.6 | |
| Trichlorobiphenyl; 2,3,3'- | 38444-84-7 | pg/g | EPA 1668A | 394 | 17500 C | 24000 JC | -31.3 | |
| Trichlorobiphenyl; 2,3,4'- | 38444-85-8 | pg/g | EPA 1668A | 197 | 3030 | 3500 | -14.4 | |
| Trichlorobiphenyl; 2,3,4- | 55702-46-0 | pg/g | EPA 1668A | 78.7 | 1290 C | 1400 | -8.2 | |
| Trichlorobiphenyl; 2,3',4'- | 38444-86-9 | pg/g | EPA 1668A | 78.7 | C21 | C21 | | |
| Trichlorobiphenyl; 2,3',4- | 55712-37-3 | pg/g | EPA 1668A | 19.7 | 890 | 1300 | -37.4 | |
| Trichlorobiphenyl; 2,3,5- | 55720-44-0 | pg/g | EPA 1668A | 19.7 | 19.7 U | 15 | 4.7 | |
| Trichlorobiphenyl; 2,3',5'- | 37680-68-5 | pg/g | EPA 1668A | 19.7 | 64.1 | 110 | -52.7 | |
| Trichlorobiphenyl; 2,3',5- | 38444-81-4 | pg/g | EPA 1668A | 39.4 | 1740 C | 2500 C | -35.8 | |
| Trichlorobiphenyl; 2,3,6- | 55702-45-9 | pg/g | EPA 1668A | 19.7 | 62 | 50 | 12 | |
| Trichlorobiphenyl; 2,3',6- | 38444-76-7 | pg/g | EPA 1668A | 19.7 | 520 | 790 | -41.2 | |
| Trichlorobiphenyl; 2,4,4'- | 7012-37-5 | pg/g | EPA 1668A | 394 | C20 | JC20 | | |
| Trichlorobiphenyl; 2,4,5- | 15862-07-4 | pg/g | EPA 1668A | 39.4 | C26 | C26 | | |
| Trichlorobiphenyl; 2,4',5- | 16606-02-3 | pg/g | EPA 1668A | 197 | 10300 | 13000 J | -23.2 | |

Table 4-1
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP14 8/9/2010 | | | |
|--|------------|------|-------------------|----------|--------------------------------------|------------|-------|-----|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Trichlorobiphenyl; 2,4,6- | 35693-92-6 | pg/g | EPA 1668A | 39.4 | C18 | C18 | | |
| Trichlorobiphenyl; 2,4',6- | 38444-77-8 | pg/g | EPA 1668A | 19.7 | 3030 | 4400 | -36.9 | |
| Trichlorobiphenyl; 3,3',4- | 37680-69-6 | pg/g | EPA 1668A | 19.7 | 19.7 U | 13 | | 6.7 |
| Trichlorobiphenyl; 3,3',5- | 38444-87-0 | pg/g | EPA 1668A | 19.7 | 19.7 U | 1.2 U | | |
| Trichlorobiphenyl; 3,4,4'- | 38444-90-5 | pg/g | EPA 1668A | 197 | 387 | 580 | | 193 |
| Trichlorobiphenyl; 3,4,5- | 53555-66-1 | pg/g | EPA 1668A | 19.7 | 19.7 U | 18 | | 1.7 |
| Trichlorobiphenyl; 3,4',5- | 38444-88-1 | pg/g | EPA 1668A | 19.7 | 19.7 U | 1.3 U | | |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.
2. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

pg/g = picogram per gram

RL = reporting limit

RPD = relative percent difference

EPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

C = Coeluting congener.

EMPC-J = Estimated detect data due to failure of one or more qualitative identification criteria.

J = Estimated detect data.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

Table 4-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP15 7/26/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|-------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Chlorobiphenyl; 2- | 2051-60-7 | pg/g | EPA 1668A | 19.8 | 64.7 | 79 | | 14.3 |
| Chlorobiphenyl; 3- | 2051-61-8 | pg/g | EPA 1668A | 19.8 | 19.8 U | 5 | | 14.8 |
| Chlorobiphenyl; 4- | 2051-62-9 | pg/g | EPA 1668A | 19.8 | 19.8 U | 12 | | 7.8 |
| Decachlorobiphenyl | 2051-24-3 | pg/g | EPA 1668A | 19.8 | 443 | 730 J | -48.9 | |
| Dichlorobiphenyl; 2,2' | 13029-08-8 | pg/g | EPA 1668A | 19.8 | 525 | 720 | -31.3 | |
| Dichlorobiphenyl; 2,3' | 25569-80-6 | pg/g | EPA 1668A | 19.8 | 139 | 200 | -36.0 | |
| Dichlorobiphenyl; 2,3- | 16605-91-7 | pg/g | EPA 1668A | 19.8 | 19.8 U | 5.5 J | | 14.3 |
| Dichlorobiphenyl; 2,4' | 34883-43-7 | pg/g | EPA 1668A | 198 | 489 | 680 | -32.7 | |
| Dichlorobiphenyl; 2,4- | 33284-50-3 | pg/g | EPA 1668A | 19.8 | 19.8 U | 16 | | 3.8 |
| Dichlorobiphenyl; 2,5- | 34883-39-1 | pg/g | EPA 1668A | 19.8 | 22.5 | 25 | | 2.5 |
| Dichlorobiphenyl; 2,6- | 33146-45-1 | pg/g | EPA 1668A | 19.8 | 35.3 | 27 | | 8.3 |
| Dichlorobiphenyl; 3,3' | 2050-67-1 | pg/g | EPA 1668A | 991 | 991 U | 190 | | 801 |
| Dichlorobiphenyl; 3,4' | 2974-90-5 | pg/g | EPA 1668A | 79.3 | C12 | C12 | | |
| Dichlorobiphenyl; 3,4- | 2974-92-7 | pg/g | EPA 1668A | 79.3 | 79.3 CU | 34 C | | 45.3 |
| Dichlorobiphenyl; 3,5- | 34883-41-5 | pg/g | EPA 1668A | 19.8 | 19.8 U | 1.2 U | | |
| Dichlorobiphenyl; 4,4' | 2050-68-2 | pg/g | EPA 1668A | 198 | 265 | 330 | | 65 |
| Heptachlorobiphenyl; 2,2',3,3',4,4',5- | 35065-30-6 | pg/g | EPA 1668A | 19.8 | 5740 | 9600 J | -50.3 | |
| Heptachlorobiphenyl; 2,2',3,3',4,4',6- | 52663-71-5 | pg/g | EPA 1668A | 39.6 | 1910 C | 2300 C | -18.5 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,5'- | 52663-74-8 | pg/g | EPA 1668A | 39.6 | 1250 | 1500 | -18.2 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,6'- | 38411-25-5 | pg/g | EPA 1668A | 39.6 | 5410 | 7100 | -27.0 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,6- | 68194-16-1 | pg/g | EPA 1668A | 39.6 | C171 | C171 | | |
| Heptachlorobiphenyl; 2,2',3,3',4,5',6'- | 52663-70-4 | pg/g | EPA 1668A | 39.6 | 4280 | 5300 | -21.3 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5',6- | 40186-70-7 | pg/g | EPA 1668A | 19.8 | 345 | 470 | -30.7 | |
| Heptachlorobiphenyl; 2,2',3,3',4,6,6'- | 52663-65-7 | pg/g | EPA 1668A | 19.8 | 700 | 1100 | -44.4 | |
| Heptachlorobiphenyl; 2,2',3,3',5,5',6- | 52663-67-9 | pg/g | EPA 1668A | 19.8 | 1860 | 2400 | -25.4 | |
| Heptachlorobiphenyl; 2,2',3,3',5,6,6'- | 52663-64-6 | pg/g | EPA 1668A | 19.8 | 1750 | 2400 | -31.3 | |
| Heptachlorobiphenyl; 2,2',3,4,4',5,5'- | 35065-29-3 | pg/g | EPA 1668A | 39.6 | 17200 C | 31000 JC | -57.3 | |
| Heptachlorobiphenyl; 2,2',3,4,4',5,6'- | 60145-23-5 | pg/g | EPA 1668A | 19.8 | 19.8 U | 82 | | 62.2 |
| Heptachlorobiphenyl; 2,2',3,4,4',5,6- | 74472-47-2 | pg/g | EPA 1668A | 19.8 | 51.9 | 71 | | 19.1 |

Table 4-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP15 7/26/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|-------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Heptachlorobiphenyl; 2,2',3,4,4',5',6- | 52663-69-1 | pg/g | EPA 1668A | 39.6 | 5820 C | 5900 | -1.4 | |
| Heptachlorobiphenyl; 2,2',3,4,4',6,6'- | 74472-48-3 | pg/g | EPA 1668A | 19.8 | 22.8 | 40 | | 17.2 |
| Heptachlorobiphenyl; 2,2',3,4,5,5',6- | 52712-05-7 | pg/g | EPA 1668A | 39.6 | C183 | 1000 | | |
| Heptachlorobiphenyl; 2,2',3,4,5,5',6- | 52663-68-0 | pg/g | EPA 1668A | 39.6 | 11400 | 15000 J | -27.3 | |
| Heptachlorobiphenyl; 2,2',3,4,5,6,6'- | 74472-49-4 | pg/g | EPA 1668A | 19.8 | 19.8 U | 0.67 U | | |
| Heptachlorobiphenyl; 2,2',3,4',5,6,6'- | 74487-85-7 | pg/g | EPA 1668A | 19.8 | 26.3 | 54 | | 27.7 |
| Heptachlorobiphenyl; 2,3,3',4,4',5,5'- | 39635-31-9 | pg/g | EPA 1668A | 19.8 | 228 | 330 | -36.6 | |
| Heptachlorobiphenyl; 2,3,3',4,4',5,6- | 41411-64-7 | pg/g | EPA 1668A | 19.8 | 1400 | 1800 | -25.0 | |
| Heptachlorobiphenyl; 2,3,3',4,4',5',6- | 74472-50-7 | pg/g | EPA 1668A | 19.8 | 283 | 400 | -34.3 | |
| Heptachlorobiphenyl; 2,3,3',4,5,5',6- | 74472-51-8 | pg/g | EPA 1668A | 39.6 | 39.6 U | 2.3 U | | |
| Heptachlorobiphenyl; 2,3,3',4',5,5',6- | 69782-91-8 | pg/g | EPA 1668A | 39.6 | C180 | JC180 | | |
| Hexachlorobiphenyl; 2,2',3,3',4,4'- | 38380-07-3 | pg/g | EPA 1668A | 39.6 | 2190 C | 3000 JC | -31.2 | |
| Hexachlorobiphenyl; 2,2',3,3',4,5'- | 52663-66-8 | pg/g | EPA 1668A | 19.8 | 1150 | 1600 | -32.7 | |
| Hexachlorobiphenyl; 2,2',3,3',4,5- | 55215-18-4 | pg/g | EPA 1668A | 59.5 | 21500 C | 29000 JC | -29.7 | |
| Hexachlorobiphenyl; 2,2',3,3',4,6'- | 38380-05-1 | pg/g | EPA 1668A | 19.8 | 4060 | 5200 | -24.6 | |
| Hexachlorobiphenyl; 2,2',3,3',4,6- | 61798-70-7 | pg/g | EPA 1668A | 19.8 | 70.6 | 83 | | 12.4 |
| Hexachlorobiphenyl; 2,2',3,3',5,5'- | 35694-04-3 | pg/g | EPA 1668A | 19.8 | 525 | 730 | 19.8 | |
| Hexachlorobiphenyl; 2,2',3,3',5,6'- | 52744-13-5 | pg/g | EPA 1668A | 39.6 | 7410 C | 10000 C | | |
| Hexachlorobiphenyl; 2,2',3,3',5,6- | 52704-70-8 | pg/g | EPA 1668A | 19.8 | 519 | 870 | -50.5 | |
| Hexachlorobiphenyl; 2,2',3,3',6,6'- | 38411-22-2 | pg/g | EPA 1668A | 19.8 | 1260 | 1800 | -35.3 | |
| Hexachlorobiphenyl; 2,2',3,4,4',5'- | 35065-28-2 | pg/g | EPA 1668A | 59.5 | C129 | JC129 | | |
| Hexachlorobiphenyl; 2,2',3,4,4',5- | 35694-06-5 | pg/g | EPA 1668A | 19.8 | 731 | 1200 | -48.6 | |
| Hexachlorobiphenyl; 2,2',3,4,4',6'- | 59291-64-4 | pg/g | EPA 1668A | 39.6 | C139 | C139 | | |
| Hexachlorobiphenyl; 2,2',3,4,4',6- | 56030-56-9 | pg/g | EPA 1668A | 39.6 | 380 C | 590 C | -43.3 | |
| Hexachlorobiphenyl; 2,2',3,4,5,5'- | 52712-04-6 | pg/g | EPA 1668A | 19.8 | 3990 | 4900 | -20.5 | |
| Hexachlorobiphenyl; 2,2',3,4',5,5'- | 51908-16-8 | pg/g | EPA 1668A | 19.8 | 4630 | 5700 | -20.7 | |
| Hexachlorobiphenyl; 2,2',3,4,5,6'- | 68194-15-0 | pg/g | EPA 1668A | 19.8 | 19.8 U | 57 | | 37.2 |
| Hexachlorobiphenyl; 2,2',3,4,5,6- | 41411-61-4 | pg/g | EPA 1668A | 19.8 | 19.8 U | 1.1 U | | |
| Hexachlorobiphenyl; 2,2',3,4,5',6- | 68194-14-9 | pg/g | EPA 1668A | 19.8 | 929 | 1300 | -33.3 | |

Table 4-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP15 7/26/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|-------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Hexachlorobiphenyl; 2,2',3,4',5,6'- | 74472-41-6 | pg/g | EPA 1668A | 19.8 | 116 | 190 | -48.4 | |
| Hexachlorobiphenyl; 2,2',3,4',5,6- | 68194-13-8 | pg/g | EPA 1668A | 39.6 | 15700 C | 20000 JC | -24.1 | |
| Hexachlorobiphenyl; 2,2',3,4',5,6- | 38380-04-0 | pg/g | EPA 1668A | 39.6 | C147 | JC147 | | |
| Hexachlorobiphenyl; 2,2',3,4,6,6'- | 74472-40-5 | pg/g | EPA 1668A | 19.8 | 19.8 U | 0.73 U | | |
| Hexachlorobiphenyl; 2,2',3,4',6,6'- | 68194-08-1 | pg/g | EPA 1668A | 19.8 | 76.4 | 130 | -51.9 | |
| Hexachlorobiphenyl; 2,2',3,5,5',6- | 52663-63-5 | pg/g | EPA 1668A | 39.6 | C135 | C135 | | |
| Hexachlorobiphenyl; 2,2',3,5,6,6'- | 68194-09-2 | pg/g | EPA 1668A | 19.8 | 19.8 U | 32 | | 12.2 |
| Hexachlorobiphenyl; 2,2',4,4',5,5'- | 35065-27-1 | pg/g | EPA 1668A | 39.6 | 25400 C | 44000 JC | -53.6 | |
| Hexachlorobiphenyl; 2,2',4,4',5,6'- | 60145-22-4 | pg/g | EPA 1668A | 19.8 | 779 | 1200 | -42.5 | |
| Hexachlorobiphenyl; 2,2',4,4',6,6'- | 33979-03-2 | pg/g | EPA 1668A | 19.8 | 248 | 440 J | -55.8 | |
| Hexachlorobiphenyl; 2,3,3',4,4',5'- | 69782-90-7 | pg/g | EPA 1668A | 39.6 | C156 | JC156 | | |
| Hexachlorobiphenyl; 2,3,3',4,4',5- | 38380-08-4 | pg/g | EPA 1668A | 39.6 | 1890 C | 2900 JC | -42.2 | |
| Hexachlorobiphenyl; 2,3,3',4,4',6- | 74472-42-7 | pg/g | EPA 1668A | 19.8 | 1880 | 2500 | -28.3 | |
| Hexachlorobiphenyl; 2,3,3',4,5,5'- | 39635-35-3 | pg/g | EPA 1668A | 19.8 | 177 | 4.7 UJ | | 172.3 |
| Hexachlorobiphenyl; 2,3,3',4',5,5'- | 39635-34-2 | pg/g | EPA 1668A | 19.8 | 69.6 | 120 EMPC-J | -53.2 | |
| Hexachlorobiphenyl; 2,3,3',4,5,6- | 41411-62-5 | pg/g | EPA 1668A | 19.8 | 19.8 U | 0.78 U | | |
| Hexachlorobiphenyl; 2,3,3',4,5',6- | 74472-43-8 | pg/g | EPA 1668A | 19.8 | 19.8 U | 0.72 U | | |
| Hexachlorobiphenyl; 2,3,3',4',5,6- | 74472-44-9 | pg/g | EPA 1668A | 59.5 | C129 | JC129 | | |
| Hexachlorobiphenyl; 2,3,3',4',5',6- | 74472-45-0 | pg/g | EPA 1668A | 19.8 | 1260 | 1400 | -10.5 | |
| Hexachlorobiphenyl; 2,3,3',5,5',6- | 74472-46-1 | pg/g | EPA 1668A | 19.8 | 19.8 U | 24 | | 4.2 |
| Hexachlorobiphenyl; 2,3',4,4',5,5'- | 52663-72-6 | pg/g | EPA 1668A | 19.8 | 837 | 1300 J | -43.3 | |
| Hexachlorobiphenyl; 2,3,4,4',5,6- | 41411-63-6 | pg/g | EPA 1668A | 39.6 | C128 | JC128 | | |
| Hexachlorobiphenyl; 2,3',4,4',5',6- | 59291-65-5 | pg/g | EPA 1668A | 39.6 | C153 | JC153 | | |
| Hexachlorobiphenyl; 3,3',4,4',5,5'- | 32774-16-6 | pg/g | EPA 1668A | 19.8 | 19.8 U | 7.6 UJ | | |
| Nonachlorobiphenyl; 2,2',3,3',4,4',5,5',6- | 40186-72-9 | pg/g | EPA 1668A | 39.6 | 1040 | 1900 J | -58.5 | |
| Nonachlorobiphenyl; 2,2',3,3',4,4',5,6,6'- | 52663-79-3 | pg/g | EPA 1668A | 39.6 | 167 | 200 | -18.0 | |
| Nonachlorobiphenyl; 2,2',3,3',4,5,5',6,6'- | 52663-77-1 | pg/g | EPA 1668A | 19.8 | 412 | 720 | -54.4 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,5'- | 35694-08-7 | pg/g | EPA 1668A | 19.8 | 3180 | 4500 | -34.4 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,6'- | 42740-50-1 | pg/g | EPA 1668A | 39.6 | 2050 | 2300 | -11.5 | |

Table 4-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP15 7/26/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------------|-------------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,6- | 52663-78-2 | pg/g | EPA 1668A | 19.8 | 1340 | 1900 | -34.6 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',6,6'- | 33091-17-7 | pg/g | EPA 1668A | 79.3 | 453 C | 170 | 90.9 | |
| Octachlorobiphenyl; 2,2',3,3',4,5,5',6'- | 52663-75-9 | pg/g | EPA 1668A | 39.6 | C198 | C198 | | |
| Octachlorobiphenyl; 2,2',3,3',4,5,5',6- | 68194-17-2 | pg/g | EPA 1668A | 39.6 | 4280 C | 4900 C | -13.5 | |
| Octachlorobiphenyl; 2,2',3,3',4,5,6,6'- | 52663-73-7 | pg/g | EPA 1668A | 79.3 | C197 | 380 | | |
| Octachlorobiphenyl; 2,2',3,3',4,5',6,6'- | 40186-71-8 | pg/g | EPA 1668A | 19.8 | 546 | 680 | -21.9 | |
| Octachlorobiphenyl; 2,2',3,3',5,5',6,6'- | 2136-99-4 | pg/g | EPA 1668A | 19.8 | 938 | 1400 | -39.5 | |
| Octachlorobiphenyl; 2,2',3,4,4',5,5',6'- | 52663-76-0 | pg/g | EPA 1668A | 19.8 | 2550 | 3100 | -19.5 | |
| Octachlorobiphenyl; 2,2',3,4,4',5,6,6'- | 74472-52-9 | pg/g | EPA 1668A | 19.8 | 19.8 U | 3.4 | | 16.4 |
| Octachlorobiphenyl; 2,3,3',4,4',5,5',6- | 74472-53-0 | pg/g | EPA 1668A | 19.8 | 165 | 260 J | -44.7 | |
| PCB Congener | 38380-05-8 | pg/g | EPA 1668A | 19.8 | 420000 | 589000 | -33.5 | |
| Pentachlorobiphenyl; 2,2',3,3',4- | 52663-62-4 | pg/g | EPA 1668A | 19.8 | 833 | 1200 | -36.1 | |
| Pentachlorobiphenyl; 2,2',3,3',5- | 60145-20-2 | pg/g | EPA 1668A | 19.8 | 632 | 870 | -31.7 | |
| Pentachlorobiphenyl; 2,2',3,3',6- | 52663-60-2 | pg/g | EPA 1668A | 19.8 | 1680 | 2100 | -22.2 | |
| Pentachlorobiphenyl; 2,2',3,4,4'- | 65510-45-4 | pg/g | EPA 1668A | 59.5 | 3160 C | 4300 C | -30.6 | |
| Pentachlorobiphenyl; 2,2',3,4,5'- | 38380-02-8 | pg/g | EPA 1668A | 119 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,2',3,4,5- | 55312-69-1 | pg/g | EPA 1668A | 119 | 9060 C | 13000 C | -35.7 | |
| Pentachlorobiphenyl; 2,2',3,4',5'- | 41464-51-1 | pg/g | EPA 1668A | 119 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,2',3,4',5- | 68194-07-0 | pg/g | EPA 1668A | 59.5 | 17400 C | 25000 JC | -35.8 | |
| Pentachlorobiphenyl; 2,2',3,4,6'- | 73575-57-2 | pg/g | EPA 1668A | 19.8 | 149 | 180 | -18.8 | |
| Pentachlorobiphenyl; 2,2',3,4,6- | 55215-17-3 | pg/g | EPA 1668A | 39.6 | 2610 C | 2.8 U | | 2607 |
| Pentachlorobiphenyl; 2,2',3,4',6'- | 60233-25-2 | pg/g | EPA 1668A | 39.6 | 988 C | 25 | | 963 |
| Pentachlorobiphenyl; 2,2',3,4',6- | 68194-05-8 | pg/g | EPA 1668A | 39.6 | C88 | 3600 | | |
| Pentachlorobiphenyl; 2,2',3,5,5'- | 52663-61-3 | pg/g | EPA 1668A | 19.8 | 3910 | 5500 | -33.8 | |
| Pentachlorobiphenyl; 2,2',3,5,6'- | 73575-55-0 | pg/g | EPA 1668A | 19.8 | 198 | 300 | -41.0 | |
| Pentachlorobiphenyl; 2,2',3,5,6- | 73575-56-1 | pg/g | EPA 1668A | 39.6 | 1840 C | 2500 C | -30.4 | |
| Pentachlorobiphenyl; 2,2',3,5',6- | 38379-99-6 | pg/g | EPA 1668A | 19.8 | 9310 | 12000 J | -25.2 | |
| Pentachlorobiphenyl; 2,2',3,6,6'- | 73575-54-9 | pg/g | EPA 1668A | 19.8 | 80.4 | 120 | -39.5 | |
| Pentachlorobiphenyl; 2,2',4,4',5- | 38380-01-7 | pg/g | EPA 1668A | 19.8 | 10300 | 13000 J | -23.2 | |

Table 4-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP15 7/26/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Pentachlorobiphenyl; 2,2',4,4',6- | 39485-83-1 | pg/g | EPA 1668A | 39.6 | C93 | C93 | | |
| Pentachlorobiphenyl; 2,2',4,5,5'- | 37680-73-2 | pg/g | EPA 1668A | 59.5 | C90 | JC90 | | |
| Pentachlorobiphenyl; 2,2',4,5,6'- | 68194-06-9 | pg/g | EPA 1668A | 39.6 | C98 | 1400 | | |
| Pentachlorobiphenyl; 2,2',4,5',6- | 60145-21-3 | pg/g | EPA 1668A | 19.8 | 645 | 800 | -21.5 | |
| Pentachlorobiphenyl; 2,2',4,6,6'- | 56558-16-8 | pg/g | EPA 1668A | 19.8 | 181 | 250 | -32.0 | |
| Pentachlorobiphenyl; 2,3,3',4,4'- | 32598-14-4 | pg/g | EPA 1668A | 39.6 | 4840 | 7700 | -45.6 | |
| Pentachlorobiphenyl; 2,3,3',4,5'- | 70362-41-3 | pg/g | EPA 1668A | 39.6 | 311 C | 400 C | -25.0 | |
| Pentachlorobiphenyl; 2,3,3',4,5- | 70424-69-0 | pg/g | EPA 1668A | 19.8 | 19.8 U | 1.6 U | | 18.2 |
| Pentachlorobiphenyl; 2,3,3',4',5' | 76842-07-4 | pg/g | EPA 1668A | 19.8 | 20.7 | 47 | | 26.3 |
| Pentachlorobiphenyl; 2,3,3',4',5- | 70424-68-9 | pg/g | EPA 1668A | 19.8 | 1140 | 1500 | -27.3 | |
| Pentachlorobiphenyl; 2,3,3',4,6- | 74472-35-8 | pg/g | EPA 1668A | 119 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,3,3',4',6- | 38380-03-9 | pg/g | EPA 1668A | 39.6 | 14800 C | 19000 J | -24.9 | |
| Pentachlorobiphenyl; 2,3,3',5,5'- | 39635-32-0 | pg/g | EPA 1668A | 19.8 | 19.8 U | 35 | | 15.2 |
| Pentachlorobiphenyl; 2,3,3',5,6- | 74472-36-9 | pg/g | EPA 1668A | 19.8 | 101 | 46 | 74.8 | |
| Pentachlorobiphenyl; 2,3,3',5',6- | 68194-10-5 | pg/g | EPA 1668A | 59.5 | C90 | JC90 | | |
| Pentachlorobiphenyl; 2,3,4,4',5- | 74472-37-0 | pg/g | EPA 1668A | 19.8 | 340 | 540 | -45.5 | |
| Pentachlorobiphenyl; 2,3',4,4',5'- | 65510-44-3 | pg/g | EPA 1668A | 39.6 | 273 | 420 | -42.4 | |
| Pentachlorobiphenyl; 2,3',4,4',5- | 31508-00-6 | pg/g | EPA 1668A | 39.6 | 15200 | 22000 J | -36.6 | |
| Pentachlorobiphenyl; 2,3,4,4',6- | 74472-38-1 | pg/g | EPA 1668A | 39.6 | C110 | 310 | | |
| Pentachlorobiphenyl; 2,3',4,4',6- | 56558-17-9 | pg/g | EPA 1668A | 119 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,3',4,5,5'- | 68194-12-7 | pg/g | EPA 1668A | 19.8 | 96.5 | 130 | | 33.5 |
| Pentachlorobiphenyl; 2,3',4',5,5'- | 70424-70-3 | pg/g | EPA 1668A | 39.6 | C108 | C108 | | |
| Pentachlorobiphenyl; 2,3,4,5,6- | 18259-05-7 | pg/g | EPA 1668A | 59.5 | C85 | C85 | | |
| Pentachlorobiphenyl; 2,3,4',5,6- | 68194-11-6 | pg/g | EPA 1668A | 59.5 | C85 | 650 | | |
| Pentachlorobiphenyl; 2,3',4,5',6- | 56558-18-0 | pg/g | EPA 1668A | 19.8 | 24.6 | 37 | | 12.4 |
| Pentachlorobiphenyl; 2,3',4',5',6- | 74472-39-2 | pg/g | EPA 1668A | 119 | C86 | C86 | | |
| Pentachlorobiphenyl; 3,3',4,4',5- | 57465-28-8 | pg/g | EPA 1668A | 19.8 | 43.3 | 60 J | | 16.7 |
| Pentachlorobiphenyl; 3,3',4,5,5'- | 39635-33-1 | pg/g | EPA 1668A | 19.8 | 32 | 1.8 U | | 30.2 |
| Tetrachlorobiphenyl, 2,3,4,5- | 33284-53-6 | pg/g | EPA 1668A | 159 | 15600 C | 19000 JC | -19.7 | |

Table 4-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP15 7/26/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------------|-----------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Tetrachlorobiphenyl; 2,2',3,3'- | 38444-93-8 | pg/g | EPA 1668A | 19.8 | 5260 C | 7200 JC | -31.1 | |
| Tetrachlorobiphenyl; 2,2',3,4'- | 36559-22-5 | pg/g | EPA 1668A | 19.8 | 3040 | 4600 J | -40.8 | |
| Tetrachlorobiphenyl; 2,2',3,4- | 52663-59-9 | pg/g | EPA 1668A | 39.6 | 406 | 600 J | -38.6 | |
| Tetrachlorobiphenyl; 2,2',3,5'- | 41464-39-5 | pg/g | EPA 1668A | 59.5 | 19600 C | 28000 JC | -35.3 | |
| Tetrachlorobiphenyl; 2,2',3,5- | 70362-46-8 | pg/g | EPA 1668A | 19.8 | 503 | 680 J | -29.9 | |
| Tetrachlorobiphenyl; 2,2',3,6'- | 41464-47-5 | pg/g | EPA 1668A | 19.8 | 359 | 380 J | -5.7 | |
| Tetrachlorobiphenyl; 2,2',3,6- | 70362-45-7 | pg/g | EPA 1668A | 39.6 | 4560 C | 1200 J | 116.7 | |
| Tetrachlorobiphenyl; 2,2',4,4'- | 2437-79-8 | pg/g | EPA 1668A | 59.5 | C44 | JC44 | | |
| Tetrachlorobiphenyl; 2,2',4,5'- | 41464-40-8 | pg/g | EPA 1668A | 39.6 | 10600 C | 16000 JC | -40.6 | |
| Tetrachlorobiphenyl; 2,2',4,5- | 70362-47-9 | pg/g | EPA 1668A | 19.8 | 836 | 1000 J | -17.9 | |
| Tetrachlorobiphenyl; 2,2',4,6'- | 68194-04-7 | pg/g | EPA 1668A | 39.6 | C45 | 5800 J | | |
| Tetrachlorobiphenyl; 2,2',4,6- | 62796-65-0 | pg/g | EPA 1668A | 39.6 | 1990 C | 3500 JC | -55.0 | |
| Tetrachlorobiphenyl; 2,2',5,5'- | 35693-99-3 | pg/g | EPA 1668A | 39.6 | 15000 | 20000 J | -28.6 | |
| Tetrachlorobiphenyl; 2,2',5,6'- | 41464-41-9 | pg/g | EPA 1668A | 39.6 | C50 | JC50 | | |
| Tetrachlorobiphenyl; 2,2',6,6'- | 15968-05-5 | pg/g | EPA 1668A | 19.8 | 181 | 310 | -52.5 | |
| Tetrachlorobiphenyl; 2,3,3',4'- | 41464-43-1 | pg/g | EPA 1668A | 198 | 1650 | 2000 J | -19.2 | |
| Tetrachlorobiphenyl; 2,3,3',4- | 74338-24-2 | pg/g | EPA 1668A | 19.8 | 216 | 74 J | 97.9 | |
| Tetrachlorobiphenyl; 2,3,3',5'- | 41464-49-7 | pg/g | EPA 1668A | 19.8 | 19.8 U | 39 J | | 19.2 |
| Tetrachlorobiphenyl; 2,3,3',5- | 70424-67-8 | pg/g | EPA 1668A | 19.8 | 38.2 | 62 J | | 23.8 |
| Tetrachlorobiphenyl; 2,3,3',6- | 74472-33-6 | pg/g | EPA 1668A | 59.5 | 1320 C | 1900 JC | -36.0 | |
| Tetrachlorobiphenyl; 2,3,4,4'- | 33025-41-1 | pg/g | EPA 1668A | 39.6 | 2090 | 2600 J | -21.7 | |
| Tetrachlorobiphenyl; 2,3',4,4'- | 32598-10-0 | pg/g | EPA 1668A | 198 | 13100 | 15000 J | -13.5 | |
| Tetrachlorobiphenyl; 2,3,4',5- | 74472-34-7 | pg/g | EPA 1668A | 19.8 | 651 | 880 J | -29.9 | |
| Tetrachlorobiphenyl; 2,3',4,5'- | 73575-52-7 | pg/g | EPA 1668A | 19.8 | 189 | 290 J | -42.2 | |
| Tetrachlorobiphenyl; 2,3',4,5- | 73575-53-8 | pg/g | EPA 1668A | 39.6 | 113 | 170 J | | 57 |
| Tetrachlorobiphenyl; 2,3',4',5'- | 70362-48-0 | pg/g | EPA 1668A | 159 | C61 | JC61 | | |
| Tetrachlorobiphenyl; 2,3',4',5- | 32598-11-1 | pg/g | EPA 1668A | 159 | C61 | JC61 | | |
| Tetrachlorobiphenyl; 2,3,4,6- | 54230-22-7 | pg/g | EPA 1668A | 59.5 | C59 | JC59 | | |
| Tetrachlorobiphenyl; 2,3,4',6- | 52663-58-8 | pg/g | EPA 1668A | 39.6 | 6660 | 9900 J | -39.1 | |

Table 4-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP15 7/26/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|-------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Tetrachlorobiphenyl; 2,3',4,6- | 60233-24-1 | pg/g | EPA 1668A | 39.6 | C49 | JC49 | | |
| Tetrachlorobiphenyl; 2,3',4',6- | 41464-46-4 | pg/g | EPA 1668A | 19.8 | C40 | JC40 | | |
| Tetrachlorobiphenyl; 2,3',5,5' | 41464-42-0 | pg/g | EPA 1668A | 19.8 | 185 | 270 J | -37.4 | |
| Tetrachlorobiphenyl; 2,3,5,6- | 33284-54-7 | pg/g | EPA 1668A | 59.5 | C44 | JC44 | | |
| Tetrachlorobiphenyl; 2,3',5',6- | 74338-23-1 | pg/g | EPA 1668A | 19.8 | 222 | 170 J | 26.5 | |
| Tetrachlorobiphenyl; 2,4,4',5- | 32690-93-0 | pg/g | EPA 1668A | 159 | C61 | JC61 | | |
| Tetrachlorobiphenyl; 2,4,4',6- | 32598-12-2 | pg/g | EPA 1668A | 59.5 | C59 | JC59 | | |
| Tetrachlorobiphenyl; 3,3',4,4'- | 32598-13-3 | pg/g | EPA 1668A | 39.6 | 510 | 840 J | -48.9 | |
| Tetrachlorobiphenyl; 3,3',4,5'- | 41464-48-6 | pg/g | EPA 1668A | 19.8 | 63.2 | 120 J | -62.0 | |
| Tetrachlorobiphenyl; 3,3',4,5- | 70362-49-1 | pg/g | EPA 1668A | 19.8 | 67.9 | 3.3 UJ | | 64.6 |
| Tetrachlorobiphenyl; 3,3',5,5' | 33284-52-5 | pg/g | EPA 1668A | 19.8 | 72.2 | 3.3 UJ | | 68.9 |
| Tetrachlorobiphenyl; 3,4,4',5- | 70362-50-4 | pg/g | EPA 1668A | 39.6 | 39.6 U | 53 J | | 13.4 |
| Trichlorobiphenyl; 2,2',3- | 38444-78-9 | pg/g | EPA 1668A | 19.8 | 934 | 1600 | -52.6 | |
| Trichlorobiphenyl; 2,2',4- | 37680-66-3 | pg/g | EPA 1668A | 19.8 | 1910 | 3000 | -44.4 | |
| Trichlorobiphenyl; 2,2',5- | 37680-65-2 | pg/g | EPA 1668A | 39.6 | 2860 C | 4900 C | -52.6 | |
| Trichlorobiphenyl; 2,2',6- | 38444-73-4 | pg/g | EPA 1668A | 19.8 | 437 | 770 J | -55.2 | |
| Trichlorobiphenyl; 2,3,3'- | 38444-84-7 | pg/g | EPA 1668A | 396 | 14400 C | 21000 JC | -37.3 | |
| Trichlorobiphenyl; 2,3,4'- | 38444-85-8 | pg/g | EPA 1668A | 198 | 2570 | 3300 J | -24.9 | |
| Trichlorobiphenyl; 2,3,4- | 55702-46-0 | pg/g | EPA 1668A | 79.3 | 1110 C | 1300 JC | -15.8 | |
| Trichlorobiphenyl; 2,3',4'- | 38444-86-9 | pg/g | EPA 1668A | 79.3 | C21 | JC21 | | |
| Trichlorobiphenyl; 2,3',4- | 55712-37-3 | pg/g | EPA 1668A | 19.8 | 779 | 1200 J | -42.5 | |
| Trichlorobiphenyl; 2,3,5- | 55720-44-0 | pg/g | EPA 1668A | 19.8 | 19.8 U | 11 J | | 8.8 |
| Trichlorobiphenyl; 2,3',5'- | 37680-68-5 | pg/g | EPA 1668A | 19.8 | 56.7 | 89 J | | 32.3 |
| Trichlorobiphenyl; 2,3',5- | 38444-81-4 | pg/g | EPA 1668A | 39.6 | 1440 C | 2100 JC | -37.3 | |
| Trichlorobiphenyl; 2,3,6- | 55702-45-9 | pg/g | EPA 1668A | 19.8 | 19.8 U | 39 | | 19.2 |
| Trichlorobiphenyl; 2,3',6- | 38444-76-7 | pg/g | EPA 1668A | 19.8 | 425 | 630 | -38.9 | |
| Trichlorobiphenyl; 2,4,4'- | 7012-37-5 | pg/g | EPA 1668A | 396 | C20 | JC20 | | |
| Trichlorobiphenyl; 2,4,5- | 15862-07-4 | pg/g | EPA 1668A | 39.6 | C26 | JC26 | | |
| Trichlorobiphenyl; 2,4',5- | 16606-02-3 | pg/g | EPA 1668A | 198 | 8440 | 11000 J | -26.3 | |

Table 4-2
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR4 LPR4-FHWB-COMP15 7/26/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|-------|-----|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Trichlorobiphenyl; 2,4,6- | 35693-92-6 | pg/g | EPA 1668A | 39.6 | C18 | C18 | | |
| Trichlorobiphenyl; 2,4',6- | 38444-77-8 | pg/g | EPA 1668A | 19.8 | 2330 | 3400 | -37.3 | |
| Trichlorobiphenyl; 3,3',4- | 37680-69-6 | pg/g | EPA 1668A | 19.8 | 19.8 U | 14 J | | 5.8 |
| Trichlorobiphenyl; 3,3',5- | 38444-87-0 | pg/g | EPA 1668A | 19.8 | 19.8 U | 3 UJ | | |
| Trichlorobiphenyl; 3,4,4'- | 38444-90-5 | pg/g | EPA 1668A | 198 | 377 | 700 J | | 323 |
| Trichlorobiphenyl; 3,4,5- | 53555-66-1 | pg/g | EPA 1668A | 19.8 | 19.8 U | 13 J | | 6.8 |
| Trichlorobiphenyl; 3,4',5- | 38444-88-1 | pg/g | EPA 1668A | 19.8 | 19.8 U | 3.5 UJ | | |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.
2. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

pg/g = picogram per gram

RL = reporting limit

RPD = relative percent difference

EPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

C = Coeluting congener.

EMPC-J = Estimated detect data due to failure of one or more qualitative identification criteria.

J = Estimated detect data.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

UJ = Estimated non-detect data due to exceeded quality control criteria.

Table 4-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR6 LPR6-DCWB-COMP02 7/27/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Chlorobiphenyl; 2- | 2051-60-7 | pg/g | EPA 1668A | 9.97 | 12 | 53 | | 41.00 |
| Chlorobiphenyl; 3- | 2051-61-8 | pg/g | EPA 1668A | 9.97 | 9.97 U | 2.6 EMPC-J | | 7.37 |
| Chlorobiphenyl; 4- | 2051-62-9 | pg/g | EPA 1668A | 9.97 | 9.97 U | 7.1 | | 2.87 |
| Decachlorobiphenyl | 2051-24-3 | pg/g | EPA 1668A | 9.97 | 157 | 810 J | -135.1 | |
| Dichlorobiphenyl; 2,2' | 13029-08-8 | pg/g | EPA 1668A | 9.97 | 243 | 1100 | -127.6 | |
| Dichlorobiphenyl; 2,3' | 25569-80-6 | pg/g | EPA 1668A | 9.97 | 79.6 | 310 | -118.3 | |
| Dichlorobiphenyl; 2,3- | 16605-91-7 | pg/g | EPA 1668A | 9.97 | 9.97 U | 11 J | | 1.03 |
| Dichlorobiphenyl; 2,4' | 34883-43-7 | pg/g | EPA 1668A | 99.7 | 226 | 950 | -123.1 | |
| Dichlorobiphenyl; 2,4- | 33284-50-3 | pg/g | EPA 1668A | 9.97 | 9.97 U | 35 | | 25.03 |
| Dichlorobiphenyl; 2,5- | 34883-39-1 | pg/g | EPA 1668A | 9.97 | 20.8 | 61 | -98.3 | |
| Dichlorobiphenyl; 2,6- | 33146-45-1 | pg/g | EPA 1668A | 9.97 | 15.9 | 44 | | 28.1 |
| Dichlorobiphenyl; 3,3' | 2050-67-1 | pg/g | EPA 1668A | 499 | 499 U | 110 | | 389 |
| Dichlorobiphenyl; 3,4' | 2974-90-5 | pg/g | EPA 1668A | 39.9 | C12 | JC12 | | |
| Dichlorobiphenyl; 3,4- | 2974-92-7 | pg/g | EPA 1668A | 39.9 | CU | 24 JC12 | | 24 |
| Dichlorobiphenyl; 3,5- | 34883-41-5 | pg/g | EPA 1668A | 9.97 | 9.97 U | 2.3 U | | 7.67 |
| Dichlorobiphenyl; 4,4' | 2050-68-2 | pg/g | EPA 1668A | 99.7 | 99.7 U | 210 | | 110.3 |
| Heptachlorobiphenyl; 2,2',3,3',4,4',5- | 35065-30-6 | pg/g | EPA 1668A | 9.97 | 921 | 4800 | -135.6 | |
| Heptachlorobiphenyl; 2,2',3,3',4,4',6- | 52663-71-5 | pg/g | EPA 1668A | 19.9 | 308 C | 1200 C171 | -118.3 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,5'- | 52663-74-8 | pg/g | EPA 1668A | 19.9 | 201 | 780 | -118.0 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,6'- | 38411-25-5 | pg/g | EPA 1668A | 19.9 | 1090 | 4200 | -117.6 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5,6- | 68194-16-1 | pg/g | EPA 1668A | 19.9 | C171 | C171 | | |
| Heptachlorobiphenyl; 2,2',3,3',4,5',6'- | 52663-70-4 | pg/g | EPA 1668A | 19.9 | 641 | 2500 | -118.4 | |
| Heptachlorobiphenyl; 2,2',3,3',4,5',6- | 40186-70-7 | pg/g | EPA 1668A | 9.97 | 58.4 | 230 | -119.0 | |
| Heptachlorobiphenyl; 2,2',3,3',4,6,6'- | 52663-65-7 | pg/g | EPA 1668A | 9.97 | 157 | 710 | -127.6 | |
| Heptachlorobiphenyl; 2,2',3,3',5,5',6- | 52663-67-9 | pg/g | EPA 1668A | 9.97 | 298 | 1200 | -120.4 | |
| Heptachlorobiphenyl; 2,2',3,3',5,6,6'- | 52663-64-6 | pg/g | EPA 1668A | 9.97 | 547 | 2200 | -120.3 | |
| Heptachlorobiphenyl; 2,2',3,4,4',5,5'- | 35065-29-3 | pg/g | EPA 1668A | 19.9 | 2570 C | 15000 C180 | -141.5 | |
| Heptachlorobiphenyl; 2,2',3,4,4',5,6'- | 60145-23-5 | pg/g | EPA 1668A | 9.97 | 9.97 U | 32 | | 22.03 |
| Heptachlorobiphenyl; 2,2',3,4,4',5,6- | 74472-47-2 | pg/g | EPA 1668A | 9.97 | 9.97 U | 38 | | 28.03 |

Table 4-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR6 LPR6-DCWB-COMP02 7/27/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Heptachlorobiphenyl; 2,2',3,4,4',5',6- | 52663-69-1 | pg/g | EPA 1668A | 19.9 | 882 C | 2900 | -106.7 | |
| Heptachlorobiphenyl; 2,2',3,4,4',6,6'- | 74472-48-3 | pg/g | EPA 1668A | 9.97 | 9.97 U | 23 | | 13.03 |
| Heptachlorobiphenyl; 2,2',3,4,5,5',6- | 52712-05-7 | pg/g | EPA 1668A | 19.9 | C183 | 540 | | |
| Heptachlorobiphenyl; 2,2',3,4,5,5',6- | 52663-68-0 | pg/g | EPA 1668A | 19.9 | 1560 | 6400 | -121.6 | |
| Heptachlorobiphenyl; 2,2',3,4,5,6,6'- | 74472-49-4 | pg/g | EPA 1668A | 9.97 | 9.97 U | 0.48 U | | |
| Heptachlorobiphenyl; 2,2',3,4',5,6,6'- | 74487-85-7 | pg/g | EPA 1668A | 9.97 | 9.97 U | 30 | | 20.03 |
| Heptachlorobiphenyl; 2,3,3',4,4',5,5'- | 39635-31-9 | pg/g | EPA 1668A | 9.97 | 40.7 | 180 | | 139.3 |
| Heptachlorobiphenyl; 2,3,3',4,4',5,6- | 41411-64-7 | pg/g | EPA 1668A | 9.97 | 202 | 820 | -120.9 | |
| Heptachlorobiphenyl; 2,3,3',4,4',5',6- | 74472-50-7 | pg/g | EPA 1668A | 9.97 | 42.3 | 180 | -123.9 | |
| Heptachlorobiphenyl; 2,3,3',4,5,5',6- | 74472-51-8 | pg/g | EPA 1668A | 19.9 | 19.9 U | 1.8 U | | |
| Heptachlorobiphenyl; 2,3,3',4',5,5',6- | 69782-91-8 | pg/g | EPA 1668A | 19.9 | C180 | C180 | | |
| Hexachlorobiphenyl; 2,2',3,3',4,4'- | 38380-07-3 | pg/g | EPA 1668A | 19.9 | 500 C | 2100 JC128 | -123.1 | |
| Hexachlorobiphenyl; 2,2',3,3',4,5'- | 52663-66-8 | pg/g | EPA 1668A | 9.97 | 233 | 1000 | -124.4 | |
| Hexachlorobiphenyl; 2,2',3,3',4,5- | 55215-18-4 | pg/g | EPA 1668A | 29.9 | 4260 C | 17000 C129 | -119.8 | |
| Hexachlorobiphenyl; 2,2',3,3',4,6'- | 38380-05-1 | pg/g | EPA 1668A | 9.97 | 1200 | 4400 | -114.3 | |
| Hexachlorobiphenyl; 2,2',3,3',4,6- | 61798-70-7 | pg/g | EPA 1668A | 9.97 | 47.1 | 170 | -113.2 | |
| Hexachlorobiphenyl; 2,2',3,3',5,5'- | 35694-04-3 | pg/g | EPA 1668A | 9.97 | 90.8 | 360 | -119.4 | |
| Hexachlorobiphenyl; 2,2',3,3',5,6'- | 52744-13-5 | pg/g | EPA 1668A | 19.9 | 1640 C | 6300 C135 | -117.4 | |
| Hexachlorobiphenyl; 2,2',3,3',5,6- | 52704-70-8 | pg/g | EPA 1668A | 9.97 | 201 | 890 | -126.3 | |
| Hexachlorobiphenyl; 2,2',3,3',6,6'- | 38411-22-2 | pg/g | EPA 1668A | 9.97 | 537 | 2500 | -129.3 | |
| Hexachlorobiphenyl; 2,2',3,4,4',5'- | 35065-28-2 | pg/g | EPA 1668A | 29.9 | C129 | C129 | | |
| Hexachlorobiphenyl; 2,2',3,4,4',5- | 35694-06-5 | pg/g | EPA 1668A | 9.97 | 165 | 810 | -132.3 | |
| Hexachlorobiphenyl; 2,2',3,4,4',6'- | 59291-64-4 | pg/g | EPA 1668A | 19.9 | C139 | C139 | | |
| Hexachlorobiphenyl; 2,2',3,4,4',6- | 56030-56-9 | pg/g | EPA 1668A | 19.9 | 75.7 C | 340 C139 | -127.2 | |
| Hexachlorobiphenyl; 2,2',3,4,5,5'- | 52712-04-6 | pg/g | EPA 1668A | 9.97 | 789 | 3100 | -118.8 | |
| Hexachlorobiphenyl; 2,2',3,4',5,5'- | 51908-16-8 | pg/g | EPA 1668A | 9.97 | 766 | 2800 | -114.1 | |
| Hexachlorobiphenyl; 2,2',3,4,5,6'- | 68194-15-0 | pg/g | EPA 1668A | 9.97 | 9.97 U | 36 | | 26.03 |
| Hexachlorobiphenyl; 2,2',3,4,5,6- | 41411-61-4 | pg/g | EPA 1668A | 9.97 | 9.97 U | 0.86 U | | |
| Hexachlorobiphenyl; 2,2',3,4,5',6- | 68194-14-9 | pg/g | EPA 1668A | 9.97 | 213 | 810 | -116.7 | |

Table 4-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR6 LPR6-DCWB-COMP02 7/27/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|-------------|--------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Hexachlorobiphenyl; 2,2',3,4',5,6'- | 74472-41-6 | pg/g | EPA 1668A | 9.97 | 19.3 | 86 | -126.7 | |
| Hexachlorobiphenyl; 2,2',3,4',5,6- | 68194-13-8 | pg/g | EPA 1668A | 19.9 | 3590 C | 13000 C147 | -113.4 | |
| Hexachlorobiphenyl; 2,2',3,4',5,6- | 38380-04-0 | pg/g | EPA 1668A | 19.9 | C147 | C147 | | |
| Hexachlorobiphenyl; 2,2',3,4,6,6'- | 74472-40-5 | pg/g | EPA 1668A | 9.97 | 9.97 U | 3.8 | | 6.17 |
| Hexachlorobiphenyl; 2,2',3,4',6,6'- | 68194-08-1 | pg/g | EPA 1668A | 9.97 | 17.4 | 110 | | 92.6 |
| Hexachlorobiphenyl; 2,2',3,5,5',6- | 52663-63-5 | pg/g | EPA 1668A | 19.9 | C135 | C135 | | |
| Hexachlorobiphenyl; 2,2',3,5,6,6'- | 68194-09-2 | pg/g | EPA 1668A | 9.97 | 9.97 U | 51 | | 41.03 |
| Hexachlorobiphenyl; 2,2',4,4',5,5'- | 35065-27-1 | pg/g | EPA 1668A | 19.9 | 4370 C | 22000 JC153 | -133.7 | |
| Hexachlorobiphenyl; 2,2',4,4',5,6'- | 60145-22-4 | pg/g | EPA 1668A | 9.97 | 121 | 500 | -122.1 | |
| Hexachlorobiphenyl; 2,2',4,4',6,6'- | 33979-03-2 | pg/g | EPA 1668A | 9.97 | 39.9 | 210 J | | 170.1 |
| Hexachlorobiphenyl; 2,3,3',4,4',5'- | 69782-90-7 | pg/g | EPA 1668A | 19.9 | C156 | JC156 | | |
| Hexachlorobiphenyl; 2,3,3',4,4',5- | 38380-08-4 | pg/g | EPA 1668A | 19.9 | 405 C | 1900 JC156 | -129.7 | |
| Hexachlorobiphenyl; 2,3,3',4,4',6- | 74472-42-7 | pg/g | EPA 1668A | 9.97 | 385 | 1600 | -122.4 | |
| Hexachlorobiphenyl; 2,3,3',4,5,5'- | 39635-35-3 | pg/g | EPA 1668A | 9.97 | 34.4 | 4.2 UJ | | 30.20 |
| Hexachlorobiphenyl; 2,3,3',4',5,5'- | 39635-34-2 | pg/g | EPA 1668A | 9.97 | 19.2 | 81 EMPC-J | -123.4 | |
| Hexachlorobiphenyl; 2,3,3',4,5,6- | 41411-62-5 | pg/g | EPA 1668A | 9.97 | 9.97 U | 0.63 U | | |
| Hexachlorobiphenyl; 2,3,3',4,5',6- | 74472-43-8 | pg/g | EPA 1668A | 9.97 | 9.97 U | 0.56 U | | |
| Hexachlorobiphenyl; 2,3,3',4',5,6- | 74472-44-9 | pg/g | EPA 1668A | 29.9 | C129 | C129 | | |
| Hexachlorobiphenyl; 2,3,3',4',5',6- | 74472-45-0 | pg/g | EPA 1668A | 9.97 | 270 | 890 | -106.9 | |
| Hexachlorobiphenyl; 2,3,3',5,5',6- | 74472-46-1 | pg/g | EPA 1668A | 9.97 | 9.97 U | 14 | | 4.03 |
| Hexachlorobiphenyl; 2,3',4,4',5,5'- | 52663-72-6 | pg/g | EPA 1668A | 9.97 | 165 | 780 J | -130.2 | |
| Hexachlorobiphenyl; 2,3,4,4',5,6- | 41411-63-6 | pg/g | EPA 1668A | 19.9 | C128 | JC128 | | |
| Hexachlorobiphenyl; 2,3',4,4',5',6- | 59291-65-5 | pg/g | EPA 1668A | 19.9 | C153 | JC153 | | |
| Hexachlorobiphenyl; 3,3',4,4',5,5'- | 32774-16-6 | pg/g | EPA 1668A | 9.97 | 9.97 U | 6.6 UJ | | 3.37 |
| Nonachlorobiphenyl; 2,2',3,3',4,4',5,5',6- | 40186-72-9 | pg/g | EPA 1668A | 19.9 | 307 | 1500 J | -132.0 | |
| Nonachlorobiphenyl; 2,2',3,3',4,4',5,6,6'- | 52663-79-3 | pg/g | EPA 1668A | 19.9 | 39.8 | 150 | -116.1 | |
| Nonachlorobiphenyl; 2,2',3,3',4,5,5',6,6'- | 52663-77-1 | pg/g | EPA 1668A | 9.97 | 126 | 640 | -134.2 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,5'- | 35694-08-7 | pg/g | EPA 1668A | 9.97 | 563 | 2400 | -124.0 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,6'- | 42740-50-1 | pg/g | EPA 1668A | 19.9 | 308 | 1300 | -123.4 | |

Table 4-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR6 LPR6-DCWB-COMP02 7/27/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Octachlorobiphenyl; 2,2',3,3',4,4',5,6- | 52663-78-2 | pg/g | EPA 1668A | 9.97 | 207 | 810 | -118.6 | |
| Octachlorobiphenyl; 2,2',3,3',4,4',6,6'- | 33091-17-7 | pg/g | EPA 1668A | 39.9 | 102 C | 86 | | 16.0 |
| Octachlorobiphenyl; 2,2',3,3',4,5,5',6'- | 52663-75-9 | pg/g | EPA 1668A | 19.9 | C198 | | | |
| Octachlorobiphenyl; 2,2',3,3',4,5,5',6- | 68194-17-2 | pg/g | EPA 1668A | 19.9 | 725 C | 3100 | -124.2 | |
| Octachlorobiphenyl; 2,2',3,3',4,5,6,6'- | 52663-73-7 | pg/g | EPA 1668A | 39.9 | C197 | 350 | | |
| Octachlorobiphenyl; 2,2',3,3',4,5',6,6'- | 40186-71-8 | pg/g | EPA 1668A | 9.97 | 94.3 | 380 | -120.5 | |
| Octachlorobiphenyl; 2,2',3,3',5,5',6,6'- | 2136-99-4 | pg/g | EPA 1668A | 9.97 | 201 | 880 | -125.6 | |
| Octachlorobiphenyl; 2,2',3,4,4',5,5',6- | 52663-76-0 | pg/g | EPA 1668A | 9.97 | 435 | 2000 | -128.5 | |
| Octachlorobiphenyl; 2,2',3,4,4',5,6,6'- | 74472-52-9 | pg/g | EPA 1668A | 9.97 | 9.97 U | 2.3 EMPC-J | | 7.67 |
| Octachlorobiphenyl; 2,3,3',4,4',5,5',6- | 74472-53-0 | pg/g | EPA 1668A | 9.97 | 29.4 | 140 | -130.6 | |
| PCB Congener | 38380-05-8 | pg/g | EPA 1668A | 9.97 | 106000 | 446000 | -123.2 | |
| Pentachlorobiphenyl; 2,2',3,3',4- | 52663-62-4 | pg/g | EPA 1668A | 9.97 | 432 | 1800 | -122.6 | |
| Pentachlorobiphenyl; 2,2',3,3',5- | 60145-20-2 | pg/g | EPA 1668A | 9.97 | 233 | 840 | -113.1 | |
| Pentachlorobiphenyl; 2,2',3,3',6- | 52663-60-2 | pg/g | EPA 1668A | 9.97 | 931 | 3700 | -119.6 | |
| Pentachlorobiphenyl; 2,2',3,4,4'- | 65510-45-4 | pg/g | EPA 1668A | 29.9 | 711 C | 3000 C85 | -123.4 | |
| Pentachlorobiphenyl; 2,2',3,4,5'- | 38380-02-8 | pg/g | EPA 1668A | 59.8 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,2',3,4,5- | 55312-69-1 | pg/g | EPA 1668A | 59.8 | 2600 C | 11000 C86 | -123.5 | |
| Pentachlorobiphenyl; 2,2',3,4',5'- | 41464-51-1 | pg/g | EPA 1668A | 59.8 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,2',3,4',5- | 68194-07-0 | pg/g | EPA 1668A | 29.9 | 4380 C | 19000 C90 | -125.1 | |
| Pentachlorobiphenyl; 2,2',3,4,6'- | 73575-57-2 | pg/g | EPA 1668A | 9.97 | 51.2 | 200 | -118.5 | |
| Pentachlorobiphenyl; 2,2',3,4,6- | 55215-17-3 | pg/g | EPA 1668A | 19.9 | 739 C | 1.3 U | 199.3 | |
| Pentachlorobiphenyl; 2,2',3,4',6'- | 60233-25-2 | pg/g | EPA 1668A | 19.9 | 191 C | 71 | 91.6 | |
| Pentachlorobiphenyl; 2,2',3,4',6- | 68194-05-8 | pg/g | EPA 1668A | 19.9 | C88 | 3100 | | |
| Pentachlorobiphenyl; 2,2',3,5,5'- | 52663-61-3 | pg/g | EPA 1668A | 9.97 | 902 | 3700 | -121.6 | |
| Pentachlorobiphenyl; 2,2',3,5,6'- | 73575-55-0 | pg/g | EPA 1668A | 9.97 | 70.9 | 340 | -131.0 | |
| Pentachlorobiphenyl; 2,2',3,5,6- | 73575-56-1 | pg/g | EPA 1668A | 19.9 | 341 C | 1400 C93 | -121.7 | |
| Pentachlorobiphenyl; 2,2',3,5',6- | 38379-99-6 | pg/g | EPA 1668A | 9.97 | 2960 | 11000 J | -115.2 | |
| Pentachlorobiphenyl; 2,2',3,6,6'- | 73575-54-9 | pg/g | EPA 1668A | 9.97 | 45.1 | 220 | | 174.9 |
| Pentachlorobiphenyl; 2,2',4,4',5- | 38380-01-7 | pg/g | EPA 1668A | 9.97 | 2160 | 8200 J | -116.6 | |

Table 4-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR6 LPR6-DCWB-COMP02 7/27/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Pentachlorobiphenyl; 2,2',4,4',6- | 39485-83-1 | pg/g | EPA 1668A | 19.9 | C93 | C93 | | |
| Pentachlorobiphenyl; 2,2',4,5,5'- | 37680-73-2 | pg/g | EPA 1668A | 29.9 | C90 | C90 | | |
| Pentachlorobiphenyl; 2,2',4,5,6'- | 68194-06-9 | pg/g | EPA 1668A | 19.9 | C98 | 800 | | |
| Pentachlorobiphenyl; 2,2',4,5',6- | 60145-21-3 | pg/g | EPA 1668A | 9.97 | 133 | 470 | -111.8 | |
| Pentachlorobiphenyl; 2,2',4,6,6'- | 56558-16-8 | pg/g | EPA 1668A | 9.97 | 28.8 | 150 | | 121.2 |
| Pentachlorobiphenyl; 2,3,3',4,4'- | 32598-14-4 | pg/g | EPA 1668A | 19.9 | 1150 | 5400 | -129.8 | |
| Pentachlorobiphenyl; 2,3,3',4,5'- | 70362-41-3 | pg/g | EPA 1668A | 19.9 | 129 C | 510 C108 | -119.2 | |
| Pentachlorobiphenyl; 2,3,3',4,5- | 70424-69-0 | pg/g | EPA 1668A | 9.97 | 9.97 U | 0.74 U | | |
| Pentachlorobiphenyl; 2,3,3',4',5'- | 76842-07-4 | pg/g | EPA 1668A | 9.97 | 18.1 | 98 | | 79.9 |
| Pentachlorobiphenyl; 2,3,3',4',5- | 70424-68-9 | pg/g | EPA 1668A | 9.97 | 243 | 920 | -116.4 | |
| Pentachlorobiphenyl; 2,3,3',4,6- | 74472-35-8 | pg/g | EPA 1668A | 59.8 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,3,3',4',6- | 38380-03-9 | pg/g | EPA 1668A | 19.9 | 3960 C | 16000 J | -120.6 | |
| Pentachlorobiphenyl; 2,3,3',5,5'- | 39635-32-0 | pg/g | EPA 1668A | 9.97 | 9.97 U | 18 | | 8.03 |
| Pentachlorobiphenyl; 2,3,3',5,6- | 74472-36-9 | pg/g | EPA 1668A | 9.97 | 20.9 | 32 | | 11.1 |
| Pentachlorobiphenyl; 2,3,3',5',6- | 68194-10-5 | pg/g | EPA 1668A | 29.9 | C90 | C90 | | |
| Pentachlorobiphenyl; 2,3,4,4',5- | 74472-37-0 | pg/g | EPA 1668A | 9.97 | 77.7 | 370 | -130.6 | |
| Pentachlorobiphenyl; 2,3',4,4',5'- | 65510-44-3 | pg/g | EPA 1668A | 19.9 | 61.3 | 310 | | 248.7 |
| Pentachlorobiphenyl; 2,3',4,4',5- | 31508-00-6 | pg/g | EPA 1668A | 19.9 | 3400 | 15000 J | -126.1 | |
| Pentachlorobiphenyl; 2,3,4,4',6- | 74472-38-1 | pg/g | EPA 1668A | 19.9 | C110 | 230 | | |
| Pentachlorobiphenyl; 2,3',4,4',6- | 56558-17-9 | pg/g | EPA 1668A | 59.8 | C86 | C86 | | |
| Pentachlorobiphenyl; 2,3',4,5,5'- | 68194-12-7 | pg/g | EPA 1668A | 9.97 | 18.2 | 67 | | 48.8 |
| Pentachlorobiphenyl; 2,3',4',5,5'- | 70424-70-3 | pg/g | EPA 1668A | 19.9 | C108 | C108 | | |
| Pentachlorobiphenyl; 2,3,4,5,6- | 18259-05-7 | pg/g | EPA 1668A | 29.9 | C85 | C85 | | |
| Pentachlorobiphenyl; 2,3,4',5,6- | 68194-11-6 | pg/g | EPA 1668A | 29.9 | C85 | 410 | | |
| Pentachlorobiphenyl; 2,3',4,5',6- | 56558-18-0 | pg/g | EPA 1668A | 9.97 | 9.97 U | 23 | | 13.0 |
| Pentachlorobiphenyl; 2,3',4',5',6- | 74472-39-2 | pg/g | EPA 1668A | 59.8 | C86 | C86 | | |
| Pentachlorobiphenyl; 3,3',4,4',5- | 57465-28-8 | pg/g | EPA 1668A | 9.97 | 9.97 U | 51 J | | 41.0 |
| Pentachlorobiphenyl; 3,3',4,5,5'- | 39635-33-1 | pg/g | EPA 1668A | 9.97 | 9.97 U | 0.88 U | | |
| Tetrachlorobiphenyl, 2,3,4,5- | 33284-53-6 | pg/g | EPA 1668A | 79.8 | 5120 C | 20000 JC62 | -118.5 | |

Table 4-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR6 LPR6-DCWB-COMP02 7/27/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Tetrachlorobiphenyl; 2,2',3,3'- | 38444-93-8 | pg/g | EPA 1668A | 9.97 | 1780 C | 7900 JC40 | -126.4 | |
| Tetrachlorobiphenyl; 2,2',3,4'- | 36559-22-5 | pg/g | EPA 1668A | 9.97 | 1060 | 5300 J | -133.3 | |
| Tetrachlorobiphenyl; 2,2',3,4- | 52663-59-9 | pg/g | EPA 1668A | 19.9 | 229 | 860 J | -115.9 | |
| Tetrachlorobiphenyl; 2,2',3,5'- | 41464-39-5 | pg/g | EPA 1668A | 29.9 | 5180 C | 24000 JC44 | -129.0 | |
| Tetrachlorobiphenyl; 2,2',3,5- | 70362-46-8 | pg/g | EPA 1668A | 9.97 | 9.97 U | 620 J | | 610.0 |
| Tetrachlorobiphenyl; 2,2',3,6'- | 41464-47-5 | pg/g | EPA 1668A | 9.97 | 231 | 910 J | -119.0 | |
| Tetrachlorobiphenyl; 2,2',3,6- | 70362-45-7 | pg/g | EPA 1668A | 19.9 | 1250 C | 1900 J | -41.3 | |
| Tetrachlorobiphenyl; 2,2',4,4'- | 2437-79-8 | pg/g | EPA 1668A | 29.9 | C44 | JC44 | | |
| Tetrachlorobiphenyl; 2,2',4,5'- | 41464-40-8 | pg/g | EPA 1668A | 19.9 | 3270 C | 15000 JC49 | -128.4 | |
| Tetrachlorobiphenyl; 2,2',4,5- | 70362-47-9 | pg/g | EPA 1668A | 9.97 | 677 | 2800 J | -122.1 | |
| Tetrachlorobiphenyl; 2,2',4,6'- | 68194-04-7 | pg/g | EPA 1668A | 19.9 | C45 | 3900 J | | |
| Tetrachlorobiphenyl; 2,2',4,6- | 62796-65-0 | pg/g | EPA 1668A | 19.9 | 697 C | 3600 JC50 | -135.1 | |
| Tetrachlorobiphenyl; 2,2',5,5'- | 35693-99-3 | pg/g | EPA 1668A | 19.9 | 4900 | 20000 J | -121.3 | |
| Tetrachlorobiphenyl; 2,2',5,6'- | 41464-41-9 | pg/g | EPA 1668A | 19.9 | C50 | JC50 | | |
| Tetrachlorobiphenyl; 2,2',6,6'- | 15968-05-5 | pg/g | EPA 1668A | 9.97 | 73.8 | 400 | -137.7 | |
| Tetrachlorobiphenyl; 2,3,3',4'- | 41464-43-1 | pg/g | EPA 1668A | 99.7 | 1060 | 4000 J | -116.2 | |
| Tetrachlorobiphenyl; 2,3,3',4- | 74338-24-2 | pg/g | EPA 1668A | 9.97 | 49 | 130 J | | 81.0 |
| Tetrachlorobiphenyl; 2,3,3',5'- | 41464-49-7 | pg/g | EPA 1668A | 9.97 | 9.97 U | 51 J | | 41.0 |
| Tetrachlorobiphenyl; 2,3,3',5- | 70424-67-8 | pg/g | EPA 1668A | 9.97 | 20.7 | 77 J | -115.3 | 56.3 |
| Tetrachlorobiphenyl; 2,3,3',6- | 74472-33-6 | pg/g | EPA 1668A | 29.9 | 420 C | 1800 JC59 | -124.3 | |
| Tetrachlorobiphenyl; 2,3,4,4'- | 33025-41-1 | pg/g | EPA 1668A | 19.9 | 504 | 1900 J | -116.1 | |
| Tetrachlorobiphenyl; 2,3',4,4'- | 32598-10-0 | pg/g | EPA 1668A | 99.7 | 3130 | 11000 J | -111.4 | |
| Tetrachlorobiphenyl; 2,3,4',5- | 74472-34-7 | pg/g | EPA 1668A | 9.97 | 149 | 680 J | -128.1 | |
| Tetrachlorobiphenyl; 2,3',4,5'- | 73575-52-7 | pg/g | EPA 1668A | 9.97 | 48.7 | 220 J | -127.5 | |
| Tetrachlorobiphenyl; 2,3',4,5- | 73575-53-8 | pg/g | EPA 1668A | 19.9 | 88.2 | 390 J | -126.2 | |
| Tetrachlorobiphenyl; 2,3',4',5'- | 70362-48-0 | pg/g | EPA 1668A | 79.8 | C61 | JC61 | | |
| Tetrachlorobiphenyl; 2,3',4',5- | 32598-11-1 | pg/g | EPA 1668A | 79.8 | C61 | JC61 | | |
| Tetrachlorobiphenyl; 2,3,4,6- | 54230-22-7 | pg/g | EPA 1668A | 29.9 | C59 | JC59 | | |
| Tetrachlorobiphenyl; 2,3,4',6- | 52663-58-8 | pg/g | EPA 1668A | 19.9 | 1760 | 8100 J | -128.6 | |

Table 4-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR6 LPR6-DCWB-COMP02 7/27/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------|------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Tetrachlorobiphenyl; 2,3',4,6- | 60233-24-1 | pg/g | EPA 1668A | 19.9 | C49 | JC49 | | |
| Tetrachlorobiphenyl; 2,3',4',6- | 41464-46-4 | pg/g | EPA 1668A | 9.97 | C40 | JC40 | | |
| Tetrachlorobiphenyl; 2,3',5,5' | 41464-42-0 | pg/g | EPA 1668A | 9.97 | 52.8 | 220 J | -122.6 | |
| Tetrachlorobiphenyl; 2,3,5,6- | 33284-54-7 | pg/g | EPA 1668A | 29.9 | C44 | JC44 | | |
| Tetrachlorobiphenyl; 2,3',5',6- | 74338-23-1 | pg/g | EPA 1668A | 9.97 | 155 | 140 J | 10.2 | |
| Tetrachlorobiphenyl; 2,4,4',5- | 32690-93-0 | pg/g | EPA 1668A | 79.8 | C61 | JC61 | | |
| Tetrachlorobiphenyl; 2,4,4',6- | 32598-12-2 | pg/g | EPA 1668A | 29.9 | C59 | JC59 | | |
| Tetrachlorobiphenyl; 3,3',4,4'- | 32598-13-3 | pg/g | EPA 1668A | 19.9 | 131 | 600 J | -128.3 | |
| Tetrachlorobiphenyl; 3,3',4,5'- | 41464-48-6 | pg/g | EPA 1668A | 9.97 | 28.4 | 160 J | -139.7 | |
| Tetrachlorobiphenyl; 3,3',4,5- | 70362-49-1 | pg/g | EPA 1668A | 9.97 | 11.9 | 3.1 UJ | | 8.80 |
| Tetrachlorobiphenyl; 3,3',5,5' | 33284-52-5 | pg/g | EPA 1668A | 9.97 | 9.97 U | 3.1 UJ | | |
| Tetrachlorobiphenyl; 3,4,4',5- | 70362-50-4 | pg/g | EPA 1668A | 19.9 | 19.9 U | 46 J | | 26.1 |
| Trichlorobiphenyl; 2,2',3- | 38444-78-9 | pg/g | EPA 1668A | 9.97 | 482 | 2600 | -137.4 | |
| Trichlorobiphenyl; 2,2',4- | 37680-66-3 | pg/g | EPA 1668A | 9.97 | 794 | 4000 | -133.8 | |
| Trichlorobiphenyl; 2,2',5- | 37680-65-2 | pg/g | EPA 1668A | 19.9 | 1410 C | 7000 C18 | -132.9 | |
| Trichlorobiphenyl; 2,2',6- | 38444-73-4 | pg/g | EPA 1668A | 9.97 | 210 | 1200 J | -140.4 | |
| Trichlorobiphenyl; 2,3,3'- | 38444-84-7 | pg/g | EPA 1668A | 199 | 3820 C | 15000 JC20 | -118.8 | |
| Trichlorobiphenyl; 2,3,4'- | 38444-85-8 | pg/g | EPA 1668A | 99.7 | 950 | 3100 J | -106.2 | |
| Trichlorobiphenyl; 2,3,4- | 55702-46-0 | pg/g | EPA 1668A | 39.9 | 994 C | 3600 JC21 | -113.5 | |
| Trichlorobiphenyl; 2,3',4'- | 38444-86-9 | pg/g | EPA 1668A | 39.9 | C21 | JC21 | | |
| Trichlorobiphenyl; 2,3',4- | 55712-37-3 | pg/g | EPA 1668A | 9.97 | 403 | 1600 J | -119.5 | |
| Trichlorobiphenyl; 2,3,5- | 55720-44-0 | pg/g | EPA 1668A | 9.97 | 9.97 U | 11 J | | 1.03 |
| Trichlorobiphenyl; 2,3',5'- | 37680-68-5 | pg/g | EPA 1668A | 9.97 | 22.8 | 100 J | | 77.2 |
| Trichlorobiphenyl; 2,3',5- | 38444-81-4 | pg/g | EPA 1668A | 19.9 | 683 C | 2700 JC26 | -119.2 | |
| Trichlorobiphenyl; 2,3,6- | 55702-45-9 | pg/g | EPA 1668A | 9.97 | 17.6 | 89 | | 71.4 |
| Trichlorobiphenyl; 2,3',6- | 38444-76-7 | pg/g | EPA 1668A | 9.97 | 167 | 840 | -133.7 | |
| Trichlorobiphenyl; 2,4,4'- | 7012-37-5 | pg/g | EPA 1668A | 199 | C20 | JC20 | | |
| Trichlorobiphenyl; 2,4,5- | 15862-07-4 | pg/g | EPA 1668A | 19.9 | C26 | JC26 | | |
| Trichlorobiphenyl; 2,4',5- | 16606-02-3 | pg/g | EPA 1668A | 99.7 | 3220 | 11000 J | -109.4 | |

Table 4-3
2010 Lower Passaic River Forage Fish Study
Tissue Sample Comparison
Polychlorinated Biphenyl Congeners

| Location ID: Sample ID: Sample Date: | | | | | LPR6 LPR6-DCWB-COMP02 7/27/2010 | | | |
|--|------------|------|-------------------|----------|---------------------------------------|------------|--------|-------|
| Chemical | CAS No. | Unit | Analytical Method | RL (EPA) | EPA Result | CPG Result | % RPD | ABS |
| Trichlorobiphenyl; 2,4,6- | 35693-92-6 | pg/g | EPA 1668A | 19.9 | C18 | C18 | | |
| Trichlorobiphenyl; 2,4',6- | 38444-77-8 | pg/g | EPA 1668A | 9.97 | 728 | 3200 | -125.9 | |
| Trichlorobiphenyl; 3,3',4- | 37680-69-6 | pg/g | EPA 1668A | 9.97 | 9.97 U | 7.1 J | | 2.87 |
| Trichlorobiphenyl; 3,3',5- | 38444-87-0 | pg/g | EPA 1668A | 9.97 | 9.97 U | 2.6 UJ | | |
| Trichlorobiphenyl; 3,4,4'- | 38444-90-5 | pg/g | EPA 1668A | 99.7 | 102 | 520 J | -134.4 | |
| Trichlorobiphenyl; 3,4,5- | 53555-66-1 | pg/g | EPA 1668A | 9.97 | 9.97 U | 14 J | | 4.03 |
| Trichlorobiphenyl; 3,4',5- | 38444-88-1 | pg/g | EPA 1668A | 9.97 | 17 | 3 UJ | | 14.00 |

Notes:

1. An acceptance criteria of less than or equal to 40% RPD was applied when both of the results were greater than five times the RL. An acceptance criteria of two times the RL was applied when one or both results were detected at less than five times the RL.
2. % RPD or ABS outside of the acceptance limits are bolded.

ABS = absolute difference

CPG = Cooperating Parties Group

ID = identification

pg/g = picogram per gram

RL = reporting limit

RPD = relative percent difference

EPA = United States Environmental Protection Agency

% = percent

Data Validation Qualifiers

C = Coeluting congener.

EMPC-J = Estimated detect data due to failure of one or more qualitative identification criteria.

J = Estimated detect data.

U = Compound was analyzed but not detected. The associated numerical value is the sample quantitation limit.

UJ = Estimated non-detect data due to exceeded quality control criteria.

Attachment A
**Comments on the CPG Draft 2010 Small Forage Fish Tissue
Chemistry Data Report for the Lower Passaic River Study Area**
Dated July 18, 2012

**CDM SMITH'S COMMENTS ON THE
DRAFT 2010 SMALL FORAGE FISH TISSUE CHEMISTRY DATA
FOR THE LOWER PASSAIC RIVER STUDY AREA
DATED JULY 18, 2012**

| <u>No.</u> | <u>Page No.</u> | <u>Comment</u> |
|------------|---|---|
| 1 | Page 14, Table 3-2, Appendix E, Tables E-1 through E-8 | <p>Two samples have the same sample ID, LPR8 -NPWB-Comp01. One of these samples was a Silver Shiner species sample July 28, 2010 and the other sample was a Spottail shiner tissue species sampled July, 9, 2010. Most Form 1's in Appendix F included sample dates, but they were not included on reports for inorganic arsenic, mercury, methyl mercury , high resolution PAHs, organochlorine pesticides, and total lipids.</p> <p>Please clarify why two sample s collected on different days had the same sample ID and were analyzed as separate samples.</p> |
| 2 | Pages 9-10, 27-30, 32-33, 46-47, 64, and 78-80 | <p>Figures 2-1, 4-1 through 4-6, 4-8 through 4-9, and 4-11 through 4-14 were not included in draft report, therefore they were not reviewed.</p> <p>Please include in revised report.</p> |
| 3 | Page 19, Table 4-2, Page 34, Table 4-3, Page 36, Table 4-4, Page 53, Table 4-6, Page 54, Table 4-7, Page 59, Table 4-8, Page 65, Table 4-9, and Page 81, Table 4-10 | <p>Max and Min not included in list of definitions.</p> <p>Please revise list of definitions to include Max and Min.</p> |
| 4 | Page 76, second paragraph, first sentence | <p>Suggested revision of text to clarify that zero to 100 percent detection refers to detection of DDT isomers in tissues grouped by species, rather than detection of DDT isomers in all tissue samples.</p> <p>Please consider the following revision;</p> <p>The six DDT isomers (2,4'-DDD, 4,4'-DDD, 2,4'-DDE, 4,4'-DDE, 2,4'-DDT, and 4,4'-DDT) that comprise total DDx had a detection frequency that ranged from zero to 100% in each species group of tissue samples.</p> |
| 5 | Page 76, third paragraph, first sentence | <p>Suggested revision of text to clarify that 94.4 to 100 percent detection refers to detection of individual chlordane compounds in tissues grouped by species, rather than to detection of individual chlordane compounds in all tissue samples.</p> <p>Please consider the following revision;</p> <p>The detection frequency for the individual total chlordane compounds (i.e., alpha -chlordane, gamma -chlordane, oxychlordane, cis -nonachlor, and trans-nonachlor) that comprise total chlordane ranged from 94.4 to 100% in each species group of tissue samples.</p> |

| <u>No.</u> | <u>Page No.</u> | <u>Comment</u> |
|------------|--|---|
| 6 | Appendix E, Table E-5 | Data in table is described as "equalized data" based on the report provided in Appendix F which also presents results that are not "equalized". The laboratory standard operating procedure (SOP) states that the data was corrected for quantitative interferences using a proprietary program named "Equalizer". Comparison of CPG laboratory PCB results that were equalized to results that had not been equalized did indicate slight to moderate changes were made using the program, increasing or decreasing result values. |
| 7 | Appendix K, Table 1 and Figures 21, 24, 27, 30, and 33 | The slopes contained in Table 1 do not correspond to the slopes included in the associated figures. Please correct values in Table 1 or Figures 21, 24, 27, 30, and 33 to the appropriate values. |
| 8 | Appendix E, Tables E-7 | Please note that trans-Nonachlor is the last entry in the table after calculated total compound types (eg. Total DDx). The table is in alphabetical order, but this may be confusing. |